This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

Google™ books

https://books.google.com

EASTERN ARCHIPELAGO
PILOT
VOL. I

COMPRISING
THE PHILIPPINE ISLANDS (WITH THE EXCEPTION
OF THE WESTERN COASTS OF LUZON AND
PALAWAN), SULU SEA, SULU ARCHIPELAGO, AND
THE NORTH-EAST COAST OF BORNEO.

SIXTH EDITION
1950

THE LIBRARY
REGENTS OF THE UNIVERSITY OF MINNESOTA
OMNIBUS ARTIBUS COMMUNE VINCULUM
656
G79e
1950
v. 1

ATTENT TO MARINERS
NOS. 1–1 N THE FOLLOW-
ING INF

N.M. N ING BRITISH

N SHIPOWNERS
— STUDY OF
RINERS.

N IESSAGES TO

N RITISH MER-
VESSELS.

N

N

N IGNALS, 1931.
Amendment.

No. 7 **CAUTION WITH REGARD TO SINGLE SHIPS APPROACHING SQUADRONS OR AIRCRAFT CARRIERS.**

No. 8 **WARNING SIGNALS TO DENOTE THE PRESENCE OF SUBMARINES.**

No. 9 **NAVIGATIONAL AND GALE WARNINGS, ETC., BROADCAST BY W/T AND R/T IN GREAT BRITAIN AND IRELAND.**

No. 10 **AIRCRAFT MOORING BUOYS.**

No. 11 **BRITISH ISLES.—LIST OF STORM SIGNAL STATIONS.**

No. 12 **TELEGRAPH CABLES.**

No. 13 **INFORMATION ABOUT NAVIGATIONAL WARNINGS.**

No. 14 **AVAILABILITY AT COMMERCIAL PORTS OF NOTICES TO MARINERS.**

No. 15 **ADMIRALTY PUBLICATIONS.**
Adoption of New Style Compass Rose on Admiralty Charts.

No. 16 **ADMIRALTY TIDE TABLES.**
Addenda and Corrigenda.

Copies of these Notices can be obtained **gratis** *by Masters of ships from* ***Mercantile Marine Offices in the United Kingdom.*** *Copies may also be inspected* ***at Dominion, Indian and Colonial Government Shipping Offices and at British Consulates.***

Ps. 10328. Wt. 32457/H4208. 3/51. B. & T. Ltd. Gp. 460/1.

NOTATIONS OF SUPPLEMENTS AND ANNUAL SUMMARIES OF NOTICES TO MARINERS RELATING TO THIS BOOK.

To be filled in by Navigating Officer.

(In Chart Depôts the first two columns are alone to be filled up.)

Title.	Date of Publication and Number.	Date of insertion of Note in Margins of Book.

NOTICE.

This volume should not be used without reference to the latest Supplement and Annual Summary of Notices to Mariners affecting it which may have been published.

A Supplement to this volume will generally be published annually until the latter is again taken up for revision.

After the publication of Supplement No. 1, each succeeding supplement cancels the former.

Between the time of the volume being taken up for revision and the publication of the new edition no supplement will be issued, but early in each year a Summary of the Admiralty Notices to Mariners affecting the volume, which have been published during the preceding year, will be issued as a separate publication.

The publication of all Supplements and Summaries of Notices to Mariners is announced in Admiralty Notices to Mariners.

The latest Supplement and any Annual Summary of Notices to Mariners that has been published affecting this volume will be obtainable gratuitously by purchasers of this volume from the Agents for the sale of Admiralty charts and other Hydrographic publications, on application either personally or by letter; in the latter case the cost of postage must be enclosed. For a list of these Agents *see* Admiralty Notice to Mariners No. 2, published annually.

Gt. Brit. Hydrographic Office,

Eastern Archipelago Pilot

VOLUME I

COMPRISING
THE PHILIPPINE ISLANDS (WITH THE EXCEPTION OF THE WESTERN COASTS OF LUZON AND PALAWAN), SULU SEA, SULU ARCHIPELAGO, AND THE NORTH-EAST COAST OF BORNEO

SIXTH EDITION, 1950

Crown Copyright Reserved

LONDON
PUBLISHED by the HYDROGRAPHIC DEPARTMENT, ADMIRALTY
To be obtained from
the Agents for the Sale of Admiralty Charts, etc.
1950

Pr Seventeen Shillings and Sixpence Net

656
G772
1950
v.1

CAUTION.

IN THIS WORK THE BEARINGS ARE REFERRED TO THE TRUE COMPASS, AND WHEN GIVEN IN DEGREES ARE RECKONED CLOCKWISE, FROM 000° (NORTH) TO 359°.

THE BEARINGS OF LIGHTS ARE GIVEN FROM SEAWARD.

THE LATITUDES AND LONGITUDES GIVEN IN THE TEXT ARE APPROXIMATE.

THE DISTANCES ARE EXPRESSED IN SEA-MILES OF 60 TO A DEGREE OF LATITUDE.

A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO THE TENTH PART OF A SEA-MILE. IT IS OFTEN ACCEPTED AS BEING ONE-TENTH OF A NAUTICAL MILE.

THE DEPTHS ARE GIVEN BELOW CHART DATUM LEVEL WHERE NOT OTHERWISE STATED.

HEIGHTS ON THE LAND ARE GIVEN ABOVE MEAN LEVEL OF HIGH WATER SPRING TIDES.

FIGURES IN BRACKETS GIVEN AFTER THOSE DENOTING FEET, FATHOMS AND YARDS ARE THEIR EQUIVALENTS IN METRES.

TIME IS EXPRESSED IN THE FOUR-FIGURE NOTATION COMMENCING AT MIDNIGHT.

THE TERM "STEAM VESSEL" USED HEREIN INCLUDES ANY VESSEL PROPELLED BY MACHINERY.

A NAME IN BRACKETS, IMMEDIATELY FOLLOWING ANOTHER NAME, IS THE OBSOLETE NAME WHICH IS STILL SHOWN ON THE ADMIRALTY CHARTS. AS A GENERAL RULE, THE BRACKETED NAME IS ONLY INSERTED IN THE DESCRIPTION OF THE PLACE OR OBJECT PREVIOUSLY BEARING THAT NAME.

WHEN SHADING IS USED TO INDICATE COLOURS OF FLAGS, TIDAL LIGHT SIGNALS, OR BEACONS, IT IS AS FOLLOWS:

▦	▥	▤	▧	■
Yellow.	Red.	Blue.	Green.	Black.

1562967

ADVERTISEMENT TO THE SIXTH EDITION

The Eastern Archipelago Pilot, Vol. I, contains a description of the coasts of the Philippine islands (except the western coasts of Luzon and Palawan), the Sulu sea, Sulu archipelago, and the North-east coast of Borneo.

This, the sixth edition, has been prepared by Captain F. M. Hodgson, R.N., and contains the latest information received in the Hydrographic Department.

The meteorological information has been revised by the Meteorological Office of the Air Ministry. Temperature is expressed in degrees Fahrenheit, rainfall in inches, speed in knots, and distance in sea-miles, unless expressly stated otherwise. Information received from meteorological services, which do not use these units, has been converted into the units mentioned above by the Meteorological Office.

Mariners and others are invited in the interests of navigation to forward to the Hydrographer, Admiralty, Oxgate Lane, Cricklewood, London, N.W.2, any information that may come under their notice, which would be useful for the correction of the charts and other hydrographical publications issued by the British Admiralty ; *early* advice as to newly-discovered dangers, the establishment of, or changes in, any aids to navigation is specially requested.

Copies of a form (H. 102) on which to render information, can be obtained gratis from the Hydrographer of the Navy, Hydrographic Supplies Establishment, Creechbarrow House, Taunton, Somerset, or from any of the Admiralty Chart Agents in Great Britain and abroad, a list of whom is published, annually, in Admiralty Notice to Mariners No. 2.

By the publication of this volume, the fifth edition of Eastern Archipelago Pilot, Vol. I, 1935, and Supplement No. 9, 1949, are cancelled, and all information affecting that work contained in Notices to Mariners up to and including No. 1232 of 1950, has been embodied in this volume ; for Temporary and Preliminary Notices to Mariners affecting this edition, the list of Temporary and Preliminary Notices to Mariners in force, published monthly in the weekly edition of the Admiralty Notice to Mariners, should be consulted.

A. DAY,
Rear-Admiral and
Hydrographer of the Navy.

Hydrographic Department,
Admiralty, London,
30th June 1950.

BIBLIOGRAPHY

Authorities, other than British Government publications, consulted in the preparation of the sixth edition :—

United States Coast Pilot, Philippine Islands, Part I, 1939.

United States Coast Pilot, Philippine Islands, Part II, 1939.

United States List of Lights and Fog signals, Vol. II, 1949.

Zeemansgids voor Nederlandsch Oost-Indië, Deel II, 1947, and Supplement No. 2, 1949, thereto.

Ports of the World, 3rd Edition, 1949.

Statesman's Year Book, 1949.

CONTENTS

INTRODUCTORY

PAGE
Caution . . . . facing ii
Advertisement iii
Bibliography iv
Table of Contents v
List of views vii
Glossary of Foreign words ix
System of Orthography xi
Information relating to Charts and Publications, General Navigation and General Meteorology xv
Index Chart . . . . facing 1

CHAPTER I
Philippine islands—Sulu archipelago—Borneo—State of North Borneo—Sulu sea—Currents—Tidal streams—Signals—Radio stations 1–37

CHAPTER II
West coast of Mindoro—Mindoro strait—Calamian group—Sulu sea—Cuyo and Cagayan islands 38–75

CHAPTER III
East coast of Palawan 76–98

CHAPTER IV
Islands and channels between Palawan and Borneo—North-east coast of Borneo from Tanjong Sampanmangio to Sandakan 99–141

CHAPTER V
North-east coast of Borneo from Sandakan to Mandul eiland 142–188

PAGE

CHAPTER VI

Sulu archipelago 189–236

CHAPTER VII

Basilan strait—West and South coasts of Mindanao . 237–303

CHAPTER VIII

Lubang islands—Verde island passage to Iloilo by the western and eastern routes—SW. coast of Luzon—East coast of Mindoro—Tablas, Sibuyan, and adjacent islands—Panay—Visayan sea 304–368

CHAPTER IX

Verde Island passage to San Bernardino strait—Marinduque, Burias, Ticao and Masbate islands—Port Cebu to San Bernardino strait 369–435

CHAPTER X

Negros and Bohol—West and south-east coasts of Cebu—South-west coast of Leyte—North coast of Mindanao 436–498

CHAPTER XI

North and east coasts of Luzon to the entrance to San Bernardino strait 499–559

CHAPTER XII

East, south, and south-west coasts of Samar—East coast of Leyte—Surigao strait—East coast of Mindanao . 560–632

APPENDICES

I.—List of ports available for under-water repairs . 633

II.—List of principal ports, showing particulars of depths, &c. 634

III.—List of spots suitable for magnetic observations . 635

Index 637

LIST OF VIEWS

	On or facing page
Cape Santiago lighthouse	38
Maniguin island lighthouse	38
Lusaran point lighthouse	38
Tanguingui islet lighthouse	38
Jintotolo island	39
North Gigante lighthouse	39
Calabazas island lighthouse	39
Bagatao island lighthouse	39
Ocata island	39
Cuyo islands from north-eastward	64
View, in two parts, of Dumaran island from south-eastward	64
View, in two parts, of the east coast of Palawan from eastward of Puerto Princesa	90
View, in two parts, of the south-east coast of Palawan	91
Balabac island from northward	91
Eastern side of Balabac island	91
Balambangan island	118
Mallawallé island	118
Tigabu island	118
Bo aan island from north-westward	134
Inner route between Mallawallé island and Sandakan	134
Taganak island	134
Western shore of Labuk bay	135
Two views of the northern approach to Sandakan	135
Two views of Pulau Gaia	160
View, in three parts, of the northern shore of Sibuko bay from south-eastward of Tawau	170
Si Amil island	171
Southern approach to Ligitan channel	171
Northern approach to Trusan Tando Bulong	171

On or facing page

South-eastern approach to Trusan Tando Bulong . . . 174
South-western approach to Trusan Tando Bulong . . . 174
Clearing mark for Ligitan reefs 174
View, in two parts, of the northern shore of Sibuko bay from Friedrich haven 175
South-western approach to Friedrich haven 175
Northern shore of Sibuko bay from south-western approach to Friedrich haven 177
Northern approach to Coal Mine reach 177
View, in two parts, of the northern coast of Tawitawi island and adjacent islands 204
Jolo island 204
Basilan island and part of Mindanao from north-north-westward 229
Palmas island from southward 303

GLOSSARIES OF WORDS OCCASIONALLY FOUND IN THE CHARTS AND SAILING DIRECTIONS.

MALAY

Malay.	English.
Ayer	Water
Baharu, Bahru	New
Barat	West, western
Batang	River
Batu	Rock, stone
Besar	Large, great
Beting	Shoal, sand
Bukit	Hill
Dalam or Dalem	Deep, depth
Darat	Coast, land
Gunong	Mountain
Gusong	Reef of rocks, sandbank
Itam	Black
Jambatan	Mole, jetty
Kalapa or Kelapa	Coconut
Kaler	North
Kali	River
Kampong	Village
Karang	Coral
Kechil	Little, small
Kering, Kring	Dry
Kidul	South
Kuala	Mouth of a river
Kulon	West
Labuan	Anchorage
Laut	Sea
Lor	North
Lumpur	Mud
Muara	Mouth of a river
Negri	Country, state
Nipa	Small marsh palm
Nusa	Island
Panjang	Long
Pantai	Coast, seaboard
Pasir	Sand, shoal
Pisang	Banana
Prau	Boat, ship
Pulau	Island
Putih	White
Rendah	Low
Rumah	House
Salatan	South
Selat	Channel, strait
Sungei	River
Tanah	Land
Tanjong	Cape, point
Telok	Bay
Tepilaut	Coast, seaboard
Timur	East
Tohor	Shallow
Tokong	Reef, rock
Trumbu	A dangerous hidden shoal
Trusan	Channel
Tuwak	Old
Ujong	Cape, point
Utara	North, northern
Wetan	East

TAGALA

Tagala.	English.
Baibai	Coast, seaboard
Bakal	Iron
Balai	House
Bato	Rock, stone
Bayan	Town
Bohangin	Sand
Bondog	Mountain
Daan	Road
Dagat	Sea
Darung	Ship
Habagat	South
Hilaga	North
Ilog	River
Ilogan	Mouth of a river
Kahui	Tree
Kalonoran	West
Kauit	A creek, bend, hook; frequently employed to name a point.
Kitir	Strait
Kogon	A reed used for roofing houses
Kota	Fort
Losak	Mud
Luk	Bay
Lupa	Land
Mababa	Low
Mahaba	Long
Maitim	Black
Malaki	Large, great
Munti	Little, small
Ongot	Cape, point
Pantalan	Mole, jetty
Poio	Island
Silangan	East
Takut	Shoal, sand
Tubig	Water
Tuyo	Dry

SYSTEM OF ORTHOGRAPHY.

The following rules for the spelling of geographical names (termed the R.G.S. II system) have been adopted for British official use, and the names in Admiralty Hydrographic publications will be rendered in accordance with these rules as opportunity occurs.

In new editions of the various volumes of sailing directions names are, generally speaking, given in accordance with these rules, but where the name on the chart shows an older rendering of a name, such chart name is given in brackets after the new rendering and will also be given in the Index.

The rules for spelling in the R.G.S. II system are as follows:—

(1) The spelling of every place-name in an independent country or self-governing dominion using the Roman alphabet (including " Roman " alphabets containing extra or modified letters, such as Czech, Serb-Croat, Polish, Romanian, &c.) shall be that adopted by the country or dominion.

(2) In colonial possessions the spelling of such place-names as belong to languages coming under Rule (1) will be spelt in accordance with that rule.

(3) The accents and diacritical marks in official use by the above countries will be retained. Wherever it appears desirable, the pronunciation will be shown by giving the name as transliterated on the system below.

(4) All other place-names throughout the world will be spelled in general accordance with the following system.

The broad features of this system are—

(*a*) That vowels are pronounced as in Italian and consonants as in English:

(*b*) That every letter is pronounced, and no redundant letters are used.

This system aims at giving a close approximation to the *local* pronunciation; but it is recognised that in some languages, notably Russian, Greek, and Arabic, the necessity for letter-for-letter transliteration often renders this impossible.

TABLE OF SPELLING AND PRONUNCIATION R.G.S. II.

a	The long and short Italian vowels, as in *lāvă*	Somāli; Răvennă.*
ä	Between *a* in *fat* and *e* in *eh*?; chiefly in Teutonic and Finno-Ugrian languages	Mähring; Pärnu.
ai	The two Italian vowels, frequently diphthongal, almost as in *aisle*; but pronounced *ei* and *ĕ* in Greek names	Wadai; Shanghai.
au	The two Italian vowels; frequently diphthongal; almost as *ou* in *out*	Sakau; Bauchi.
aw	When followed by a consonant, or when terminal, as in *awl*, *law*	Dawna; Saginaw.
b	As in English.	
c	Not to be used, but always replaced by *k* or *s*; except in the compound *ch*, and in many conventionally-spelt words, as	Kandahar; Serang. Calcutta; Celébes.
ch	As in *church*; never *tch* or *tsch* for this sound	Chad; Kerch.
d‡	As in English.	
dh	Soft *th* as in *they*; a slight *d* sound sometimes preceding it in Semitic languages	Hadhramaut; Riyadh.
e	Long as in *eh*? short as in *bet*. (For the *e* sound in the French *je*, see note at end on the "neutral vowel.")	Gēlo; Mafĕking.*
(ee)	Used for *i* (*q.v.*) only in a few conventional names	Darjeeling; Keelung.
ei	The two Italian vowels, frequently diphthongal as in *rein*, but pronounced *i* in Greek names	Beirut; Raheita.
(eu)	Not used as a single sound.	
f	As in English; *ph* must not be used for this sound	Mustafa; Maidan-i-Naftun.
g	Hard, as in *get*, *gift*: never as in *gem*, *gin*	Gedáref; Gilgit.
gh	Soft guttural, the Arabic *ghain*	Ghadames; Baghdad.
h	Used only when sounded; or in the compounds *ch*, *dh*, *gh*, *kh*, *sh*, *th*, *zh*	Ahmadabad; 'Abdullah.
i	Long as in *marine*; short as in *piano*	Fiji; Kibonde.
j	As in English; except in transcription of Chinese, where it equals *zh*, or the French *j*	Juba, Ujiji (Eng. *j*); but Jaoping (Fr. *j*).
k	As in English; hard *c* should never be used (except in conventionally-spelt words)—thus, not Corea, Cabul, but	Korea; Kabul.
kh	Hard aspirated guttural, as in the Scottish *loch* (not as in *lock*)	Khan; Sebkha.
l‡ **m** **n‡**	As in English.	

*The long and short symbols given here are merely for explanation, not for use.

‡See note at end on *Liquid sounds*.

ng	Has three separate sounds, as in *vanguard*, *finger*, and *singer*. If necessary to distinguish, a hyphen may be placed, as in *van-guard*, *singer-*	In-galla ; Bongo ; Ng-ami ; Tong-a.
ngg	May be used for the sound of *ng* as in *finger* ..	Trengganu ; Yanggang-a.
o	Long as in *both*¶ : short as in *rotund*	Kigōma ; Hŏnŏlulu.*
ö	As in German ; equals the French *eu* in *peu* ; or nearly the English sound in *fur*	Barköl.
(oo)	Used for *u* (*q.v.*) only in a few conventional names, chiefly Indian and Chinese	Poona ; Foochow.
oi	The two Italian vowels ; frequently diphthongal as in *oil*, but pronounced like *i* in *fit* in Greek names	Hanoi.
öi	The diphthong as in French *oeil* and Norwegian *höi*	Höiland.
ou	Dissyllabic, and not as French or English *ou*, except in Greek names where it has the French value	Zlatoust ; Yaroua.
ow	Used as a diphthongal combination of *ō* and *w* only in the romanisation of Chinese	Hankow.
p	As in English.	
ph	As in *loophole* ; not to be used for the *f*-sound, except conventionally	Chemulpho ; Haiphong.
q	Represents *only* the Arabic *qaf* and the Hebrew *qof* ; i.e. a guttural *k* (as a rule)	Qena ; Qiryath.
qu	Should never be employed to represent the sound of *kw* ; thus, not Namaqua, Quorra, but	Namakwa ; Kworra.
r	As in English ; should be distinctly pronounced.	
s‡	As English *ss* in *boss*, not as in *these* or *pleasure*	Burgos ; Masikesi.
sch	As in *discharge*	Peschanka.
sh **t‡**	As in English.	
th	Hard *th* as in *thick*, not as in *this* (except conventionally in Fijian)	'Athlith ; Thingvellir.
u	Long as in *rude*, or as *oo* in *boot* ; short as in *pull*	Zūlū ; Rŭanda.*
ü	As in German : equals the French *u*, as in *tu* (Fr.)	Üsküdar.
v **w** **x**	As in English.	
y	Always a consonant, as in *yard* ; it should not be used as a terminal vowel, *e* or *i* being substituted ; e.g. not Kwaly or Wady, but	Kikuyu ; Maya. Kwale ; Wadi.
z	As in *gaze*, not as in *azure*.	
zh	As the *s* in *treasure*, the *z* in *azure*, or the French *j* in *je* ; but for the sound in Chinese use *j* (*vide* note about under *j*)	Zhob.

*The long and short symbols given here are merely for explanation, not for use.
‡See note at end on *Liquid sounds*.
¶The true Italian ō is broader than this ; almost as in *broth* (=R.G.S. II *aw*). The letter *o* is conventionally used for this sound in certain names in Nigeria, Tonga, &c. : e.g. Oyo, Fofoa.

NOTES.

The doubling of a vowel or a consonant is only necessary when there is a distinct repetition of the single sound, and should otherwise be avoided	Nuusafee; Moorea; Jidda; Muhammad.
Accents should not generally be employed; but in order to indicate or emphasise the stress, an acute accent may be used	Saráwak; Qántara; Tong-atábu; Paraná,
A long or short mark over a vowel (e.g. ā, ŏ) should only be used (and that sparingly) when without it there would be danger of mispronunciation ..	Kūt; Kyōto; Abŏso.
Hyphens will not be used except to indicate pronunciation and with the particle *-i-* (in Persian, Fijian, &c.)	Ta-if; Pusht-i-Kuh; Nuku-i-Ra.

Inverted comma and apostrophe.—The inverted comma ʻ is employed only to represent the Arabic *ʻain*, the Maltese *ʻg̱hain*, and the Hebrew *ʻayin*. The apostrophe ʼ in foreign words indicates a liquid sound (*see* below).

Liquid sounds.—The occasional "liquid" or "palatalised" sound of *d*, *l*, *n* *s*, *t*, &c. (as in *d'you*, *lure*, *new*, *pursue*, *tune*, &c.) is as a rule sufficiently represented by a following *y*; where, however, owing to a following consonant, or to the palatalised letter coming at the end of a word, the *y* is inapplicable, the liquid sound will be represented by an apostrophe, thus: *d'*, *l'*, *n'*, *s'*, *t'*, &c.

The "Neutral vowel."—The "indeterminate" or "neutral" vowel sound (*er*), i.e. the sound of *a* in *marine*, *e* in *often*, *i* in *stir*, *io* in *nation*, *o* in *connect*, *ou* in *curious*, *u* in *difficult*, &c., *e* in French *je*, or the often unwritten vowel (*Fat-ha*) in Arabic, &c., is represented as a rule by *a*: as in Basra, Hawiya; but sometimes by *e*, when the sound approximates more to *e* than to *a*; as Meshed, El Gezira.

(In any guide to pronunciation issued by the Permanent Committee on Geographical Names, the "neutral vowel" is represented generally by the italic *e*: occasionally also by italic *a* or *u*.)

This sound must not be confused with *e-mute*, where the *e* is not sounded at all: as in Abbeville.

Nasal vowels.—In illustrating the pronunciation of French, Portuguese, Polish, &c., nasal vowels, the nasalisation will be represented by italic *n*; as Częstochowa pr. Chā*n*stokhóva.

Note.—The Royal Geographical Society has published a book entitled "Alphabets of Foreign Languages transcribed into English according to the R.G.S. II system." This book enables the correct rendering of names to be obtained, also of names in languages which are transliterated letter for letter.

INFORMATION RELATING TO ADMIRALTY CHARTS AND PUBLICATIONS, GENERAL NAVIGATION, AND GENERAL METEOROLOGY.

ON THE CORRECTION OF ADMIRALTY CHARTS.

Guides to Navigation.—In addition to the charts, the navigational publications which are primarily affected by the continual changes and alterations that take place are the Admiralty Sailing Directions, the Admiralty List of Lights, Fog Signals and Visual Time Signals, and the Admiralty List of Radio Signals. The Admiralty Notices to Mariners contain information mainly for the correction of the charts and navigational publications.

CHARTS.

1. **Degree of Reliance.**—It should be clearly understood that the value of a chart depends on the character of the original survey and on the completeness of the reports of subsequent changes. The remarks on " The Use of Charts as Navigational Aids, &c.", which are subjoined, should be carefully studied in this connection.

2. **System of Dating and Issue of Corrected Copies.**—Admiralty charts after first publication are kept corrected by means of new editions, large corrections, and small corrections. Copies of charts issued by the Hydrographic Supplies Establishment, Admiralty Chart Agents or Admiralty Chart Depôts are corrected, except from temporary and preliminary Notices to Mariners, for all navigational information to the date of issue.

New Charts.—The date of publication of a chart is shown outside the bottom margin, in the middle, e.g. :—

Published at the Admiralty 30th May, 1947.

New Editions.—When a chart is revised throughout and modernised in style a new edition is published, the date being shown outside the bottom margin and to the right of the date of publication, e.g. :—

New Edition 2nd Jany., 1947.

All large and small corrections notations are at the same time erased, and all old copies of the charts are cancelled.

Large Corrections.—When a chart is corrected from important information which is too comprehensive to promulgate by Admiralty Notice to Mariners or to insert conveniently by hand on existing copies, but when the chart is not revised throughout, the date on which these corrections are made is shown on the chart outside the bottom margin and to the right of the date of publication, and in the case of a chart already marked with a new edition date, below such date, e.g. :—

Large corrections 10th Feb., 1947.

All small corrections notations are at the same time erased, and all copies of the chart are cancelled.

Small Corrections.—

(*i*) When a chart is corrected from the information promulgated in an Admiralty Notice to Mariners (except temporary and preliminary Notices), the year, if not already shown, and number of the notice are entered in the bottom left-hand corner of the chart, e.g. :—

Small corrections 1947–*903*.

Copies of the chart stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents and the Admiralty Chart Depôts are corrected by hand from such information.

(*ii*) When a chart is corrected from information which is considered of no importance from the standpoint of safe navigation, and which is, therefore, not promulgated in an Admiralty Notice to Mariners, the year, if not already shown, and date of the correction are entered on the chart, in one of two ways, in the bottom left-hand corner below the margin and in sequence with the notations referred to in the preceding paragraph, e.g. :—

Small corrections, 1947—$\boxed{5.20}$—

or Small corrections 1947—(VI.*25*)

These indicate that the chart received minor corrections on the 20th May or 25th June, respectively.

In such cases copies of the chart held by ships and establishments are not usually replaced by new copies, but in exceptional cases, e.g., when new compasses are inserted, new copies of the charts may be supplied. It should, however, be particularly noted that the absence of corrections represented by square or bracket dates from a chart does not invalidate it for navigation.

3. **Correction of Charts in Ships.**—All small but important corrections affecting navigation that can be made to the charts by hand are promulgated in Admiralty Notices to Mariners and, with the exception of corrections from temporary or preliminary Notices, should at once be neatly made in waterproof violet ink on the charts affected, the year (if not already shown) and numbers of the notices being inserted, also in waterproof violet ink, in the bottom left-hand corner of the chart. The recognised abbreviations shown on Admiralty chart No. 5011 (" Signs and abbreviations used on Admiralty Charts ") should be used.

Generally speaking, the amount of information which should be inserted on a chart should be in accordance with that already shown.

On large-scale charts, the abridged descriptions, as shown on chart No. 5011, of all details of all lights, light-buoys and fog signals, and the year dates of obstructions, reported shoals, dredged channels, depth on bars or in shifting channels, and irregularities of lights, should be inserted.

On coastal charts, the abridged descriptions of only the principal lights and fog signals, i.e., those to assist in approaching or making the land, should be inserted.

Particulars of such lights should be omitted, in the following order, as the scale of the chart decreases, viz. :—

(i) Elevation, (ii) Period, (iii) Number in Group, and (iv) Visibility.

Particulars of fog signals should be inserted in their appropriate positions if space permits, but should otherwise be entered in a tabulated list under the title or some other convenient place on the chart.

Inner harbour light-buoys and beacons should not be inserted on coastal charts, and against other light-buoys only the character of the light should be inserted.

On ocean charts, lights which are visible 15 miles or over should alone be inserted and then only their character and colour.

On all charts, writing should be inserted as much as possible clear of the water, unless the relative objects are on the water, and care should be taken not to obliterate any information already on the chart. When cautionary or tidal notes, &c., are inserted, they should be written in a convenient but *conspicuous* place, preferably near the title, where they will not interfere with other details.

Erasures should never be made but the details should, when necessary, be crossed through in waterproof violet ink.

Admiralty Notices to Mariners are occasionally accompanied by reproductions of portions of charts (known as " blocks "), and when correcting charts from such blocks the following points should be borne in mind :—

(i) A block may not only indicate the insertion of new information, *but also the omission of matter previously shown.* The latter would, however, invariably be mentioned in the text of the Notice, and the fact that a block accompanies a Notice should not cause the text of the Notice to be disregarded.

(ii) The limiting lines of a block are determined for convenience of reproduction and need not be adhered to when cutting out for pasting on the chart, provided that the point mentioned in the preceding paragraph is taken into consideration.

(iii) The new information shown on a block can sometimes be inserted on the chart by hand, the reason for issuing a block in such a case being to avoid a long description of the new information in the text of the Notice.

(iv) Owing to distortion the blocks do not always fit the charts exactly, care should therefore be taken when pasting a block on to a chart that the more important navigational corrections fit as closely as possible. This can best be assured by fitting the block while it is dry and making two or three pencil ticks round the edges for use as fitting marks after the paste is applied.

Corrections from Temporary or Preliminary Notices to Mariners should be inserted on the charts *in pencil* and the year and number of the notice should be shown against them, e.g. :—N.M. 625/1947 temp., and also in the bottom left-hand corner of the chart, in pencil, *below* the small corrections notations (*see* above). Temporary corrections should be rubbed out when the notice is received cancelling them, but preliminary corrections should be inked in when the notice is received reporting that the changes have been made.

Charts stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents and the Admiralty Chart Depôts are *not* corrected from Temporary or Preliminary Notices to Mariners, and when charts are received from one of these sources they should be corrected in pencil as necessary from the copies of such Notices already held, or from those supplied with the charts.

Corrections from Radio Navigational Warnings concerning derelicts and drifting obstructions, the temporary extinction of lights, displacement of important aids to navigation, ice reports, &c., should also be noted *in pencil*, as received, on the charts affected. Radio Navigational Warnings of a permanent nature and those relating to derelicts and drifting obstructions dangerous to navigation are re-issued in the form of Admiralty Notices to Mariners, but other warnings are not re-issued in this way, except in special circumstances.

Corrections from information received from authorities other than the Admiralty should be noted, *in pencil*, on the charts affected, but no charted danger is to be expunged without the authority of the Hydrographer of the Navy.

NAVIGATIONAL PUBLICATIONS.

1. Admiralty Sailing Directions, Supplements, &c.—The Admiralty Sailing Directions, consisting of about 73 volumes for the whole world, contain general information useful to the navigator.

An index chart bound near the beginning of each volume shows the area dealt with and the serial numbers and limits of all Admiralty charts for the area which were published *when the volume was printed.*

Each volume is periodically revised throughout, and, in the intervals between the publication of new editions, Admiralty Notices to Mariners and Supplements are published to enable the volume to be corrected. It should, however, be clearly understood that Sailing Directions cannot be correct in all minor details after the date of the latest Supplement.

The above-mentioned corrections are not made in the Sailing Directions stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Depôts.

A new edition of each volume of Sailing Directions is published at intervals of approximately from ten to twelve years. The number of the latest Admiralty Notice to Mariners used in its compilation is given in the "Advertisement" on page iii of each volume, and the numbers of the Notices affecting it between the dates of going to press and issue to ships and establishments are given in the Notice announcing its publication, to enable the new edition to be corrected before being brought into use.

A Supplement to each volume is generally published annually, each succeeding Supplement cancelling the former. When a volume is taken up for revision, however, no further Supplement to that edition is issued, but subsequent Notices to Mariners affecting it are summarised each year and issued as a separate publication, until the new edition of the volume is published.

A tabular form for notation of the existence of Supplements and Summaries of Notices is printed on the front fly-leaf of all Sailing Directions, and these notations are made as necessary in all copies issued by the Hydrographic Supplies Establishment and the Admiralty Chart Depôts.

Supplements and Summaries of Admiralty Notices to Mariners should be retained intact. *Whenever reference is made to the Sailing*

Directions, the Supplement and, where applicable, the Summary must be consulted. The existence of a Supplement or Summary of Admiralty Notices to Mariners is to be entered in the tabular form inside the cover of the Sailing Directions. Matter appearing in the Supplements for the first time is indicated by marginal lines or underlining and deletions from the previous Supplement are indicated by brackets.

Admiralty Notices to Mariners affecting Sailing Directions *are not* to be cut up and pasted in, but the book is to be annotated in the margin, or corrected in manuscript, as convenient.

2. The Admiralty List of Lights, Fog Signals and Visual Time Signals.—The Admiralty List of Lights, Fog Signals and Visual Time Signals for the world is issued in twelve volumes divided geographically as shown on the index chart at the beginning of each volume.

Light-buoys are *not* included in the list.

The volumes are published annually at the rate of one volume per month commencing with Volume 1 in January and ending with Volume 12 in December. Supplements to these volumes will not be issued.

Each volume will be issued with an inscription on its cover and title page stating the date to which the volume has been corrected, which will be approximately six weeks prior to the date of its issue. Permanent and temporary corrections or additions to each volume, which may occur between the date of correction and date of issue, will be promulgated by Section III of Admiralty Notices to Mariners.

Amendments.—Important amendments are promulgated in Admiralty Notices to Mariners. In Section IIIA of each Weekly Complete Edition of these Notices will be found all additions and alterations made to Lights, Fog Signals and Visual Time Signals by the Notices issued during the week affected; certain other additions and alterations are also included in Section IIIA, which, though not of sufficient importance to necessitate the issue of a Notice to Mariners, will be found of use to the seaman. Section IIIB contains similar information but of a temporary character.

Corrections to the Light Lists should be made in pencil, or extracted from Section III and pasted in the appropriate volume.

Note.—Corrections are not made in copies of the Lists of Lights, &c., stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Depôts, and copies received from these sources should accordingly be corrected from the weekly editions of the Notices to Mariners before being brought into use.

3. The Admiralty List of Radio Signals.—The Admiralty List of Radio Signals is issued in three volumes.

Volume I.—Communications—Comprises particulars of radiotelegraph coast stations, together with general regulations; it also includes such subsidiary services as medical advice supplied by radio, together with details of the organisation for transmitting British official messages to merchant ships.

Volume II.—Navigational Aids—Comprises particulars of services from direction-finding stations, radiobeacons, and radio navigational aids (position fixing systems) together with radio time signals and navigational warnings (with ice signals); all relevant codes and regulations will be found in this volume.

Volume III.—Meteorological Services—Comprises particulars of weather services provided for the use of shipping, together with relevant codes and lists of meteorological observation stations.

New editions of each volume will normally be published annually.

A Supplement to each volume is also issued. These Supplements embody corrections subsequent to the date of going to press and are issued gratis with each volume. All corrections later than those included in the Supplements are promulgated in Section VI of the complete weekly edition of Admiralty Notices to Mariners.

Copies of the List stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Depôts are not kept corrected, and Lists received from these sources should accordingly be corrected from the Supplements and from the weekly editions of the Admiralty Notices to Mariners before being brought into use.

4. **The Admiralty Tide Tables.**—The Admiralty Tide Tables are published in three sections as follows:—

For "HOME WATERS (British Isles, Europe and north coast of Africa)."

For "ATLANTIC AND INDIAN OCEANS."

For "PACIFIC OCEAN AND ADJACENT SEAS."

Each section contains two parts, Part I giving tidal predictions for Standard Ports and tidal stream predictions for certain straits and channels, Part II giving data for predicting tides at places which are not Standard Ports.

Admiralty Tide Tables, Part III, contains instructions for predicting tides and tidal streams, and for analysing observations of tides and tidal streams, with tables to assist prediction and analysis.

THE USE OF CHARTS AS NAVIGATIONAL AIDS AND GENERAL REMARKS RELATING TO PRACTICAL NAVIGATION.

(1) **Reliance on a chart.**—The value of a chart must manifestly depend upon the accuracy of the survey on which it is based, and this becomes more important the larger the scale of the chart.

To estimate this the date of the survey, which is always given in the title, is a good guide. Besides the changes that, in waters where sand or mud prevails, may have taken place since the date of the survey, the earlier surveys were mostly made under circumstances that precluded great accuracy of detail, and, until a plan founded on such a survey is tested, it should be regarded with caution. It may, indeed, be said that, except in well-frequented harbours and their approaches, no surveys yet made have been so minute in their examination of the bottom as to make it certain that all dangers have been found. The fullness or scantiness of the soundings is another method of estimating the completeness of a chart. When the soundings are sparse or unevenly distributed, it may be taken for granted that the survey was not in great detail.

It appears to be insufficiently realised that the degree of reliance which may reasonably be placed upon an Admiralty chart, even in surveys of modern date, is mainly dependent on the scale on which the survey was made. The scale for publication is now generally that of the original survey, except in the case of coast sheets which are sometimes reduced. It should not, therefore, be assumed that the original survey was made on a larger scale than that published.

It must be borne in mind that the principal method of ascertaining the inequality of the bottom of the sea is by the laborious process of sounding, and that in sounding over any area, the boat or vessel obtaining the soundings is kept on given lines; that each time the lead descends, or a sonic sounding is taken, the depth over only a small area is obtained, in the case of the lead, it has a diameter of only a few inches, and that consequently each line of soundings, though miles in length, is only to be considered as representing a narrow width.

Surveys are not made on uniform scales, but each survey is made on a scale commensurate with its apparent importance. For instance, a general survey of a coast which vessels only pass in proceeding from one place to another is not usually made on a scale larger than one inch to the nautical mile, while surveys of areas where vessels are likely to anchor are made on a scale of three inches to the mile, and surveys of frequented ports or harbours likely to be used by fleets, on a scale of from six inches to ten inches to the nautical mile.

Close examination by sounding is the only method by which surveys on a large scale can be made, and in view of the vast mileage of surveys yet requiring completion in the interests of navigation, it would be a waste of time to undertake large scale coast surveys.

The scale on which a survey is to be conducted having been settled, it is manifestly superfluous to obtain more lines of soundings than can be represented on the paper. 100 soundings, which is the maximum number that can be placed with clearness on every square inch of paper, means that on a scale of one inch to the mile each sounding on the chart occupies an area representing eight acres of actual ground, whilst on a scale of six inches to the mile each sounding represents an area of a little less than a quarter of an acre, i.e., of 100 feet square.

The following diagram represents as many soundings as can be placed legibly on a square inch of paper :—

16	15	15	13	13	14	12	11	10	9
14	15	14	14	13	13	12	11	9	8
15	15	14	17	16	14	13	10	10	9
16	16	17	18	16	12	11	8_3	9	10
18	17	15	12	9	7_3	7_4	7_4	9	10
19	16	12	9	5_3	4_4	5_4	6_4	8_3	9
22	19	16	10	3_4	5_1	6_1	7_3	8_3	10
20	16	12	7_1	5_4	6_1	6_4	7_1	8_3	10
18	15	11	9	7_3	7	7_3	8_3	10	11
20	17	14	11	12	10	9	10	11	13

Little assistance in detecting excrescences on the bottom is afforded by the eye, when sounding in a boat, even in clear water, on account of the observer being within five feet of the surface; none in turbid seas. If, therefore, there is no inequality in the soundings to cause suspicion, a shoal patch between two lines may escape detection.

Thus, in a chart on a scale of one inch to the mile, an inequality of some acres in extent rising close to the surface, if it happened to be situated between two lines, might escape detection; whilst in a chart on a scale of 6 inches, inequalities as large as battleships, if lying parallel with, and between the lines of soundings, might exist without detection if they rose abruptly from an otherwise even bottom.

General coast charts should not, therefore, be looked upon as infallible, and a rocky shore should on no account be approached within the ten-fathom contour line, without taking every precaution to avoid a possible danger; and even with surveys of harbours on a scale of 6 inches to the mile vessels should avoid, if possible, passing over charted inequalities in the ground, as some isolated rocks are so sharp that the lead may not find the highest part. Better results can, however, be obtained by sonic sounding owing to the rapidity with which such soundings can be taken, but even this method will not find rocks unless the boat or vessel be directly over them.

Blank spaces among soundings mean that no soundings have been obtained in these spots. When the surrounding soundings are deep it may with fairness be assumed that in the blanks the water is also deep; but when they are shallow, or it can be seen from the rest of the chart that reefs or banks are present, such blanks should be regarded with suspicion.

Soundings in hair line, which are shown on the latest charts in upright figures, and on other charts in sloping figures, indicate that such soundings have been taken from smaller scale charts, an unreliable source, or adapted from old and imperfect surveys.

(2) **Fathom lines a caution.**—Except in plans of harbours that have been surveyed in detail, the six-fathom line on most Admiralty charts is to be considered as a caution or danger line against unnecessarily approaching the shore or bank within that line, on account of the possibility of the existence of undiscovered inequalities of the bottom, which nothing but an elaborate detailed survey could reveal. In general surveys of coasts or of little frequented anchorages, the necessities of navigation do not demand the great expenditure of time required for such a detailed survey. It is not contemplated that ships will approach the shore in such localities without taking special precautions.

The ten-fathom line is, on rocky shores, as before mentioned, another warning, especially for ships of deep draught.

Charts on which no fathom lines are marked must be especially regarded with caution, as it generally means that soundings were too scanty and the bottom too uneven to enable them to be drawn with accuracy.

Isolated soundings, shoaler than surrounding depths, should always be avoided as there is no knowing how closely the spot may have been examined.

(3) **Chart on largest scale always to be used.**—It sometimes happens that from press of work, only the copper plate of the larger scale chart of a particular locality can at once receive any extensive re-arrangement of coastline or sounding. This is an additional reason, besides the obvious one of the greater detail shown, why this largest scale chart should always be used for navigating.

(4) **Caution in using small-scale charts.**—In approaching the land or dangerous banks, regard must always be had to the scale of the chart used. A small error in laying down a position means only yards on a large-scale chart, whereas on a small scale the same amount of displacement means large fractions of a mile.

For the same reason bearings to near objects should be used in preference to objects farther off, although the latter may be more prominent, as a small error in bearing or in laying it down on the chart has a greater effect in misplacing the position the longer the line to be drawn.

(5) **Graduation.**—All plans are now being graduated in skeleton style before publication in order to facilitate easy reference to astronomical positions; previously published plans are also graduated as

opportunity offers. The graduation is, however, of necessity often based upon imperfect information of a conflicting nature; for this reason, whenever an astronomical position is quoted other than approximate (i.e., when seconds are given), it is necessary to quote also the number of the particular chart from which the position has been derived.

In this connection it is pointed out that, whenever possible, a position should be transferred from one chart to another by bearing and distance from a distinguishing feature common to both, such as a point of land or a light, &c., and not by the graduation which may differ owing to one of the charts being constructed on later and more complete astronomical data than the other.

(6) **Distortion of printed charts.**—The paper on which charts are printed is, from various causes, subject to distortion, but the effect of this is seldom sufficient to affect navigation. It must not, however, be expected that accurate series of angles taken to different points will always exactly agree when carefully plotted upon the chart, especially if the lines are to objects at some distance. The larger the chart the greater the amount of this distortion.

(7) **Buoys.**—It is manifestly impossible that any reliance can be placed on buoys always maintaining their exact position. Buoys should, therefore, be regarded as warnings and not as infallible navigating marks, especially when in exposed positions; and a ship should always, when possible, be navigated by bearings of fixed objects on shore or angles between them, and not by buoys.

(8) **Light-buoys.**—The lights shown by light-buoys cannot be implicitly relied on, as, if *occulting* or *flashing*, the apparatus may get out of order, or the light may be altogether extinguished. These lights in the British isles are from 5 to 217 candle-power.

(9) **Cable-buoys.**—Cable-buoys marking the ends of submarine cables usually are spherical or can shaped, surmounted by a globe and occasionally a flag. Below the topmark two *white fixed* lights, disposed horizontally, may be exhibited, but they cannot be implicitly relied on.

(10) **Lights.**—Arcs drawn on charts round a light are not intended to give information as to the distance at which it can be seen, but solely to indicate, in the case of lights which do not show the same characteristics or colours in all directions, the bearings between which the differences occur.

All the distances given in the Admiralty List of Lights and on the charts for the visibility of lights are calculated for a height of an observer's eye of 15 feet. The table of distances visible due to elevation, at the beginning of each volume of the Admiralty List of Lights, affords a means of ascertaining how much more or less the light is visible should the height of the eye be more or less. The glare of a powerful light is often seen far beyond the limit of visibility of the actual rays of the light, but this must not be confounded with the true range. Again, refraction may often cause a light to be seen farther than under ordinary circumstances.

When looking out for a light at night, the fact is often forgotten that from aloft the range of vision is much increased. By noting a star immediately over the light a very correct bearing may be afterwards obtained from the compass.

The intrinsic power of a light should always be considered when expecting to make it in thick weather. A weak light is easily obscured by haze, and no dependence can be placed on its being seen.

The power of a light can be estimated by remarking its candle-power, as given in the Admiralty List of Lights, and in some cases by noting how much its visibility in clear weather falls short of the range due to the elevation at which it is placed. Thus, a light standing 200 feet above the sea, and only recorded as visible at 10 miles in clear weather, is manifestly of little brilliancy, as its elevation would permit it to be seen over 20 miles, if of any power. (*See* table in the Admiralty List of Lights.)

The distance from a light cannot be estimated either by its brilliancy or its dimness.

On first making a light from the bridge, by at once lowering the eye several feet and noting whether the light is made to dip it may be determined whether the vessel is in the circle of visibility corresponding with the usual height of the eye or unexpectedly nearer the light.

(11) **Fog signals.**—Sound is conveyed in a very capricious way through the atmosphere. The following points in regard to fog signals should be borne in mind:—

(*a*) Fog signals are heard at greatly varying distances.

(*b*) Under certain conditions of atmosphere, when an air fog signal is a combination of high and low tones one of the notes may be inaudible.

(*c*) There are occasionally areas around a fog signal in which it is wholly inaudible.

(*d*) A fog may exist a short distance from a station and not be observable from it, so that the signal may not be sounded.

(*e*) Some fog signals cannot be started at a moment's notice after signs of fog have been observed.

Mariners are therefore warned that fog signals cannot be implicitly relied upon, and that *the practice of sounding should never be neglected.* Particular attention should be given to placing "Look-out men" in positions in which the noises in the ship are least likely to interfere with the hearing of the sound of an air fog signal; as experience shows that, though such a signal may not be heard from the deck or bridge when the engines are moving, it may be heard when the ship is stopped, or from a quiet position. It may sometimes be heard from aloft though not on deck.

Great assistance may be obtained from radio beacons at many important lighthouses and light-vessels, but the attention of Mariners is called to the serious dangers which may arise from their misuse. No attempt should be made to approach such a position on a radio bearing, whilst relying only on hearing the sound fog signal in sufficient time to alter course to avoid danger. When the radio fog signal is transmitted from a light-vessel, it is essential in order to avoid collision, that the bearing from the light-vessel should not be kept constant.

(12) **Tides.**—In navigating coastal waters where the range of the tide is considerable, caution is always necessary. The tidal predictions for Standard ports in the Admiralty Tide Tables can generally be relied upon to give the times of high and low water to within a few minutes, and heights within a few tenths of a foot. Larger errors are to be expected in the predictions for places which are not Standard ports, computed from the data in Part II, but such predictions computed from the harmonic constants are always sufficiently accurate for the general requirements of navigation. For Standard ports the heights of the tide at times between high and low water may usually be found within narrow limits in accordance with the instructions in Parts I and III of the Tide Tables.

The datums of Admiralty charts depending on Admiralty surveys vary with the type of tide, but usually conform with the International agreement, that datum should be " a plane so low that the tide will but seldom fall below it." The datums used by different nations, however, differ very considerably and those of Admiralty charts depending on foreign surveys are always those used by the original surveyors, which vary from " lowest possible low water " to " mean low water " in tidal waters, and are usually mean sea level in non-tidal waters.

The datum used is always stated on large-scale Admiralty charts.

Caution.—Most datums are above the lowest level to which the tide may fall; the charts therefore do not always show minimum depths.

(13) **Tidal streams.**—Where the tidal streams are semi-diurnal information regarding them is usually given, in a convenient part of the chart, in tabular form or by notes, special symbols being inserted at the positions to which the information refers. In certain cases, where the information available is incomplete, the streams are indicated by means of arrows.

There are many places where the tidal streams cannot be predicted by reference to the tide at a Standard port. Although no data for predicting the times at which they flow is given, their general direction is, in many cases, indicated by arrows on the charts. For a few of the straits and channels, where these conditions exist, tidal stream predictions are given in Admiralty Tide Tables.

Tidal streams, particularly if rotary, may vary considerably both in direction and rate; predictions of the stream must therefore always be considered approximate.

The turn of the tidal stream is not usually coincident with the times of high and low water; in fact, though in estuaries, harbour entrances, &c., the stream usually turns at about the times of high and low water, in open channels, and along open coasts generally, the turn usually occurs more nearly at half tide. Predictions of the times of high and low water must therefore never be used as predictions of the times of slack water.

It should be remembered that, even where the general direction of the stream is parallel with the shore, an indraught is usually experienced when crossing the entrances to bays and inlets.

(14) **Fixing positions.**—For further information on this subject, *see* Admiralty Manual of Navigation.

When in sight of land, every opportunity should be taken of fixing the ship's position by terrestrial objects.

(*a*) *Simultaneous bearings or angles.*—The most usual method is by compass bearings of suitable objects, and it must be borne in mind that a fix by only two bearings is liable to error, either an absolute error in taking the bearings, or those made in applying the deviation or in laying the bearings off on the chart. For these reasons, a third or check bearing of some other object should, when possible, be taken, especially when near the shore or dangers. The coincidence of the resulting three lines will prevent any mistakes if the objects are suitably placed.

The position may also be fixed by observing horizontal sextant angles of well-defined suitably placed objects. These angles may be plotted on the chart with a station-pointer. Two conditions are, however, necessary to its successful employment; first, that the objects be well chosen; and, second, that the observer is skilful and rapid in his use of the sextant and station-pointer. For the former, reference can be made to the pamphlet on the use of the station-pointer, or to the Admiralty Manual of Navigation; the latter is only to be obtained by practice.

It will readily be seen that a sextant often offers advantages, as angles can be obtained from any position whence the objects are visible, and the fix is in no way dependent on the compass.

In many narrow waters also, where the objects may yet be at some distance, as in coral harbours or narrow passages among mud banks, navigation by sextant and station-pointer is invaluable, as a true position can only be obtained by its means. A small error in either taking or plotting a bearing under such circumstances may put the ship ashore.

In all cases where great accuracy of position is required, such as the fixing of a rock or shoal, or the addition to a chart of fresh soundings or new buildings, angles should invariably be used. In such cases angles should be taken of a number of objects, five being a good number, since this not only fixes the position beyond doubt, but also affords a useful check on the accuracy of the chart itself. When running a line of soundings it is only necessary to take a third angle every now and then, firstly to make certain that the more important soundings, as at the end of a line, are correctly placed, and secondly to check the general accuracy of the chart.

Sometimes when only one of the selected objects is visible from the compass, a compass bearing of it and a sextant angle to the other may be used to fix the position.

(*b*) *Simultaneous bearing and distance.*—Attention is also directed to the very useful and handy method of fixing by the bearing and distance of a suitable object.

Should the ship be supplied with ranging equipment, its use here is obvious, but without it a very good approximate distance of an object of known height may be obtained by observing its angle of elevation and obtaining its distance from Lecky's Offshore Distance Tables, which are supplied with all sets of charts. Full directions for the use of these Tables are given with them.

(*c*) *The running fix.*—If two position lines are obtained at different times the position of the ship may be found by transferring the first position line up to the time of taking the bearing for the second position line. The point of intersection of the second and the transferred position line is the ship's position at the time of the second observation.

The accuracy of this fix will depend on the accuracy of the estimated run (over the ground) between bearings and, therefore, it is essential to take great care that an accurate allowance is made for tidal stream, current, and leeway experienced by the ship during this interval.

The method of fixing by doubling the angle on the bow is useful when passing points of land, &c., in waters where there is either no tidal stream or current, or where this can be estimated with sufficient accuracy. This method is as follows:—

Suppose that the angle between the ship's head and an object is measured, and found to be X°, and that the time of the observation is noted. Suppose also that the time is again taken when the angle between the ship's head and the object is 2X°. Then, if the course made good is the course steered, the distance of the ship from the object at the time the second bearing was taken is equal to the run (over the ground) in the interval. Hence the ship's position can at once be laid off as a bearing and distance from the object. In practice the angle X should not be less than about 25°.

The most useful form of this method, the so-called "four-point" bearing, gives a good fix for a departure, but does not ensure safety, as the point and any dangers that may lie off it are abeam before the position is obtained.

The above fix is reliable when there is no tidal stream or current or when it runs directly with or against the course of the ship. When the stream or current runs across the course of the ship or when leeway is to be allowed for, this method should never be used and the ship's position should be obtained by plotting the two bearings as a running fix.

A table "Distance of an object by two bearings" is supplied with certain chart folios, and is also given in Inman's Tables, by which the ship's position at the second bearing can be found: any two bearings at a suitable angle to each other may be used, together with the run between them, but, again, this table should not be used when the vessel is subject to a cross tidal stream or leeway.

(*d*) *The danger angle.*—The use of the danger angle in passing outlying dangers with land behind them should also not be forgotten.

A vertical danger angle is useful when the danger lies off an object such as a lighthouse, the height of which is known; the angle being obtained from the aforesaid Lecky's Tables. If a horizontal danger angle between two objects is used, however, caution is necessary, as, should the objects not be correctly placed on the chart, the angle taken from it may not serve the purpose. This method should not, therefore, be employed when the survey is old or manifestly imperfect.

(*e*) *The astronomical position line.*—When fixing by astronomical observations, attention is drawn to the great utility of the position line. Even a single position line may at times give invaluable information, as the ship must be somewhere on this line, provided that the chronometer error is accurately known.

A sounding obtained at the same time may often serve to give an approximate position. Again, by steering along, or at a required distance parallel to, a single position line, a vessel may make her port or avoid a danger, although uncertain of her position.

A very accurate position may be obtained by observations of three or more stars at evening or morning twilight, or by the observation of a bright star at daybreak and another shortly afterwards of the sun when a few degrees (not less than 10°) above the horizon. The position lines obtained from the bodies observed should differ in azimuth by 30° or more.

Mariners are also reminded that, with modern tables for correcting the altitude, observations of the moon entail practically no more calculation than those of a planet. Moon sights are sometimes available when stars are obscured by light cloud, &c.; also, an excellent position may frequently be obtained by simultaneous observations of the sun and moon.

(*f*) *The radio position line.*—A number of radio systems, of which the principal ones are M/F D/F, Radio Beacons, Consol Beacons, Loran, Gee and Decca, are now in general use from which position lines or fixes may be obtained.

The accuracy and range which may be obtained from these systems vary considerably; their great advantage over other methods lies in the fact that they can be employed under all weather and visibility conditions, though in some cases the results obtained will vary between day and night.

Special receiving equipment is generally required in order to make use of the radio signal, and some systems require special lattice charts or tables for plotting the position lines. Full details of these systems and their coverage areas are contained in Admiralty List of Radio Signals, Volume II.

The mariner should appreciate that with the position-fixing systems the accuracy of a fix will depend on three factors:—

(i) The distance of the observer from the transmitters.
(ii) The bearing of the observer from the base line joining the pair of stations which he is using.
(iii) The angle of intersection of the hyperbolic position lines.

It should be apparent from the inspection of any lattice chart that an inherent small equipment error, or a small personal error that may occur at the receiver, will cause a geographical error of varying amount according to the observer's position.

It is important to realise that accurate equipment is no guard against the vagaries of the propagation of radio waves. The beacons and systems operating on medium and low frequencies are liable to " night error " in areas where the ground and sky waves are received with equal strength; these areas will occur at ranges depending upon the particular frequency used by any beacon or system. Where the transmissions of two stations are synchronised to provide one signal reading and position line, " night error " will be a minimum along the normal to the base line joining the pair of stations, and a maximum towards the limits of their service sector.

Little is yet known about the effects of hills and discontinuities in the terrain (such as cliffs) on the speed of medium- and low-frequency radio waves.

At the other end of the radio spectrum the transmissions of systems operating on the very high frequencies are subject to distortion in abnormal atmospheric conditions.

(g) *Fixing by radar.*—Radar may also be of considerable assistance when navigating in coastal waters in low visibility or at night. It is essential, however, to appreciate the limitations of a radar set when interpreting the information obtained from it. It must be remembered that the radar horizon is only slightly farther than the visual horizon would be, in good visibility, for a height of eye equal to the height of the radar aerial. Hence no echoes will be received from a coastline lying below the radar horizon, while echoes may be received from high ground farther inland which will give a misleading impression of the range of the nearest land.

Depending on the width of its beam, the bearings from a radar set tend to be inaccurate. It is therefore preferable when fixing by radar to use ranges rather than bearings. It is then most important to consider carefully the identity of the object giving the echo, using the bearing as an indication, and the height of the object to determine whether it will appear on the radar presentation. Radar Range Nomograms are useful in deciding this, but a satisfactory result can be obtained by using " Distance to Sea Horizon Tables."

When two or more objects on the radar presentation have been selected and positively identified, a satisfactory fix can be obtained by striking arcs on the chart with the radar range of the selected objects. These arcs intercept at the ship's position. Best results will be obtained by using isolated objects such as detached lighthouses, rocky islets, and the extremities of long piers or jetties, but where no such objects are available a steep coastline with cliffs should be used.

Flat or gently shelving coastlines, such as mud flats or sand dunes, should not be used since it is difficult to identify any portion of them on the radar presentation. Identification is assisted in some areas by fitting objects, such as buoys and beacons, with radar reflectors, causing them to return strong echoes. Attention is drawn to the symbols with which such objects are marked on Admiralty Charts, and which are given in the latest edition of chart No. 5011, "Explanation of signs and abbreviations used on Admiralty Charts."

The difficulty of positive identification of objects is largely reduced if a Chart Comparison Unit is used in conjunction with the navigational radar. Fixes obtained with this equipment employ, in principle, an infinite number of ranges of the terrain in the vicinity of the ship, and in so doing a satisfactory fix will normally be assured.

In addition, radar beacons are available in some areas. Details of these and their use are given in the Admiralty List of Radio Signals, Volume II.

(15) **Observations for errors of the compass.**—No opportunity should be neglected for checking the error of the compass. When coasting, and a well-surveyed and fairly large-scale chart is available, an excellent method of observing the error is by taking the compass bearing of two suitable objects when in transit, and comparing this with the charted bearing ; there should be sufficient distance between the objects to provide a sensitive transit. When this method is not available the error should be obtained by azimuths of a heavenly body. Errors should be observed on any change of course on which the ship is steadied for a reasonable time, and at least twice a day when steering a steady course for long periods.

(16) **Change of variation of the compass.**—The gradual change in the variation must not be forgotten in laying down positions by bearing on charts. The magnetic compasses placed on the charts for the purpose of facilitating plotting become in time slightly in error, and in some cases, such as with small scales or when the lines are long, the displacement of position from neglect of this change may be of importance. The compasses are re-engraved when the error amounts to a degree, but the chart plates cannot be corrected more frequently from the impossibility of making alterations often on one spot in a copper plate.

The geographical change in the variation is in some parts of the world sufficiently rapid to need consideration. For instance, in approaching Halifax from Newfoundland the variation changes 10° in less than 500 miles, and in the English channel about 5° in 400 miles. The Variation chart should be consulted on this head.

On certain general charts embracing large areas with considerable change of variation, true compasses are placed instead of magnetic compasses, the variation being shown by *isogonic lines* (curves of equal magnetic variation), in a similar manner to the Variation chart. One or two *isogonic lines* are also sometimes placed on charts, in addition to the magnetic compasses, in order to indicate the general direction of these curves, and thus facilitate the determination of the variation to be employed in portions of the chart not in immediate proximity to any one of the engraved compasses. Magnetic variation values shown on Admiralty charts are for the 1st July of the year mentioned.

(17) **Local magnetic disturbance of the compass on board ship.**—The term "local magnetic disturbance" has reference only to the effects on the compass of magnetic masses external to the ship in

which it is placed. Observation shows that such disturbance of the compass in a ship afloat is experienced only in a few places on the globe. Magnetic laws do not permit of the supposition that it is the visible land which causes such disturbance, because the effect of a magnetic force diminishes in such rapid proportion as the distance from it increases that it would require a local centre of magnetic force of an amount absolutely unknown to affect a compass half a mile distant.

Such deflections of the compass are due to magnetite ores in the bed of the sea under the ship, and when the water is shallow, and the force strong, the compass may be temporarily deflected when passing over such a spot, but the area of disturbance will be small, unless there are many centres near together. Such areas are depicted by a special symbol on charts, and the cause of the magnetic disturbance is referred to as a Local Magnetic Anomaly.

They may also be due to wrecks lying on the bottom in moderate depths, but investigations have proved that, while deflections of unpredictable amount may be expected when very close to such wrecks, it is unlikely that deflections in excess of 7° will be experienced, nor should the disturbance be felt beyond a distance of 250 yards.

It is very desirable that whenever a ship passes over an area of local magnetic disturbance, the position should be fixed, and the facts reported as far as they can be ascertained.

(18) **Use of oil for modifying the effect of breaking waves.**—Many experiences of late years have shown that the utility of oil for this purpose is undoubted, and the application simple.

The following may serve for the guidance of seamen, whose attention is called to the fact that a very small quantity of oil, skilfully applied, may prevent much damage both to ships (especially the smaller classes) and to boats, by modifying the action of breaking seas.

The principal facts as to the use of oil are as follows:—

1. On free waves, i.e., waves in deep water, the effect is greatest.

2. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain, as nothing can prevent the larger waves from breaking under such circumstances; but even here it is of some service.

3. The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when nothing else is obtainable; but all animal and vegetable oils, such as waste oil from the engines, have great effect.

4. A small quantity of oil suffices, if applied in such a manner as to spread to windward.

5. It is useful in a ship or boat, both when running, or lying to, or in wearing.

6. No experiences are related of its use when hoisting a boat up in a sea-way at sea, but it is highly probable that much time and injury to the boat would be saved by its application on such occasions.

At anchor, when the sea is sufficient to render it difficult to hoist up or in boats, oil bags from forward or from the swinging booms have been found to render the sea alongside comparatively smooth.

7. In cold water, the oil, being thickened by the lower temperature, and not being able to spread freely, will have its effect much reduced. This will vary with the description of oil used.

8. The best method of application in a ship at sea appears to be: hanging over the side, in such a manner as to be in the water, small canvas bags, capable of holding from one to two gallons of oil, such bags being pricked with a sail needle to facilitate leakage of the oil.

The position of these bags should vary with the circumstances. Running before the wind they should be hung on either bow and allowed to tow in the water.

With the wind on the quarter the effect seems to be less than in any other position, as the oil goes astern while the waves come up on the quarter.

Lying to, the weather bow and another position farther aft seem the best places from which to hang the bags, with a sufficient length of line to permit them to draw to windward, while the ship drifts.

9. Crossing a bar with a flood tide, oil poured overboard and allowed to float in ahead of the boat which would follow with a bag towing astern, would appear to be the best plan. As before remarked, under these circumstances the effect cannot be so much trusted.

On a bar with the ebb tide it would seem to be useless to try oil for the purpose of entering.

10. For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside. The effect in this case must greatly depend upon the set of the current, and the depth of the water.

11. For a boat riding in bad weather from a sea anchor, it is recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil is diffused well ahead of the boat, and the bag can be readily hauled on board for refilling if necessary.

12. Towing a vessel in a heavy sea, oil is of the greatest service, and may prevent parting the hawser. Distribute from the towing vessel forward and on both sides; if used only aft the tow alone gets the benefit.

(19) **Mirage and abnormal refraction.**—An unusual lapse rate of temperature (and therefore density as well) with height immediately above the sea (or land) surface produces a distortion in the appearance of objects near the horizon; such a phenomenon is known as mirage.

When the surface is relatively cold (and the wind very light) so that the density of the air decreases rapidly for a short distance above the surface, light rays from objects low down near the horizon are bent down, the same way in fact as are usually the rays of the sun when entering the earth's atmosphere at a low altitude. The effect is to render visible objects that are normally below the horizon, e.g., lights may be "raised" at night at much greater distances than one would ordinarily expect. This phenomenon is known as "looming."

A further occasional effect produced when the air is appreciably warmer than the sea is "superior mirage," in which an inverted image is seen over the real object; sometimes an erect image is seen immediately above and touching the inverted one. The object and its images in this instance are well defined in contrast to the shimmering object and image of the inferior mirage. Superior mirage is most often experienced in high latitudes and wherever the sea surface temperature is abnormally low.

"Inferior mirage," the effect of which is to decrease the distance at which objects are visible in a horizontal direction, is due to a rapid increase of density with height close to the surface such as occurs when air of comparatively low temperature blows over a warmer sea, or over a tarred road or desert when a hot sun is beating down on it. In either event light rays are bent up when approaching the surface where the density of the air is much less than above. The coastline, and at times a ship or island, may appear to be floating in air above a shimmering horizon, possibly with, in the former instance, her hull either invisible or with an inverted image underneath. Inferior mirage is comparatively uncommon at sea and is more likely to be observed along a coastline than well out to sea.

When mirage is evident caution must be used in taking sights with a sextant, for abnormal refraction must necessarily be present also. With inferior mirage better, but not normal, results will usually be obtained by ascending as high as possible in the ship; with superior mirage the height of eye should be as low as possible. It is, however, advisable, whenever abnormal refraction is suspected, to measure the elevation of the celestial body above the back as well as the front horizon as explained in navigational text-books.

(20) **Aurora.**—The most common form of aurora is an arc system, single or multiple, narrow and well defined, or broad and diffuse, and centred on the magnetic meridian.

The most usual colour is pale whitish green when the auroral activity is weak and diffuse: but when the aurora arises high towards the zenith in the form of rays, rayed curtains and draperies with much rapid movement of the constituent rays, the colours sometimes become much stronger and more vivid, and include bright green, red and violet. When the curtains forming the aurora converge to form a corona, which may rotate very rapidly about the point of convergence, the displays may become very complex, filling practically the whole sky, and extending far to the equatorial side of the zenith with much rapid movement and change of colour from instant to instant.

Though the most usual duration of auroral displays in these high latitudes is several hours, they not infrequently last throughout the whole night from dusk to dawn. In such long displays the really intense and violently active periods with vivid strong colours are generally confined to spasms of 15–30 minutes, with the intervening periods filled with diffuse glows or quiet arc systems.

The absolute intensity of the light of the aurora is seldom great, and the brighter stars usually glimmer through it. In the most vivid and intense displays, the light may equal, but rarely surpasses, that of the full moon in a cloudless sky. It may give enough light to read by. On such occasions the aurora may be visible to some extent in partial twilight.

Though in high latitudes aurora occurs any time in the dark hours it is probably most frequent in the late evening hours from 9 p.m. till midnight or just after; it is more frequent in the equinoctial months than at other times and has a well-defined 11-year period of activity following the cycle of solar activity. A maximum of activity occurred in 1948, and the interval from maximum to minimum activity usually occupies a period of about 6 to 7 years. In high latitudes this cycle of activity is reflected more in the intensity and vividness of the displays than in their frequency of occurrence. Though really outstanding displays tend to occur around the years of maximum activity they may occur at any time of the cycle, except perhaps near the absolute minimum.

In addition to this 11-year cycle of activity active periods tend to recur at intervals of 27 days, *see* Magnetic Storms.

Northern hemisphere.—Aurora Borealis occurs most frequently along a zone which forms an approximate oval, of average radius 23°, with centre in the extreme north-west of Greenland. This zone of maximum frequency crosses Hudson Bay and the Labrador coast in about lat. 58° N. It runs south of Cape Farewell and along the south coast of

Iceland. It lies just north of North Cape, touches the extreme north of Novaya Zemlya, skirts Cape Chelyuskin and then eastward just north of Wrangel island into the north of Alaska. Along this zone aurora of some kind can probably be seen every suitable night when the sky is clear; 250 miles outside this maximum zone to the southward the auroral frequency decreases sharply to about 70–100 nights a year on the average, and to 20–25 nights 500 miles south of the maximum zone. Inside the maximum zone the geographical distribution of frequency is not so well established but it probably falls off more gradually than it does outside.

On the zone of maximum frequency itself aurora appears as frequently to the south of the zenith as to the north, but with increasing distance outside the zone the appearances concentrate more into the northern sky; the reverse is true inside the zone.

Southern hemisphere.—The frequency and distribution of Aurora Australis is not fully known. It is probable that it is more frequently seen at sea between about long. 50° E. and 175° W. than in other longitudes. Very fine displays have occasionally been seen in Australasia and on passages across the Southern Ocean. There is nevertheless a general impression that aurora is less frequent in the southern than in the northern hemisphere. This is probably to be accounted for by the fact that, apart from whaling and exploring expeditions, ships' tracks in general do not extend to such high latitudes as in the northern hemisphere.

The zone of maximum auroral frequency is roughly annular and is near the circumference of a circle of radius about 1,080 miles, centred in about lat. 75° S., long. 129° E. The frequency falls off both outside and inside this zone. A large part of the zone is within the continent of Antarctica.

(21) Magnetic storms.—Magnetic storms vary in intensity and frequency with the sunspot cycle, similarly to aurorae. An intense magnetic storm is always accompanied by a bright and active aurora. The deeply coloured aurorae, showing more pronounced red and green, and sometimes also blue and violet, tints, are invariably connected with magnetic storms of considerable or great intensity. Such a storm will produce simultaneous aurora in both hemispheres. In the greatest storms aurorae in some form may be visible down to about 20° north latitude in certain parts of the oceans, especially between the meridians of 30° W. and 140° W. Magnetic storms vary greatly in duration from a few minutes to several days; they are generally more intense during the hours of darkness. Long-continued storms usually show great fluctuations with periods of complete or partial quiescence. Similarly the associated aurora fluctuates between active and quiescent forms.

The origin of magnetic storms and aurorae is not yet fully understood, but they are intimately connected with the state of a local area of the sun. As the same part of the sun is again presented to the earth after an interval of about 27 days, a magnetic storm and aurora may recur at this time, usually in less intense form.

A ship's compass may tend to deviate during the progress of a considerable magnetic storm. In more intense storms the compass needle may oscillate 1° or more either side of its normal position. Such oscillation may persist for as long as 10 or 20 minutes before dying out. Further oscillation may occur after a period of quiescence. Deviations of 2° or more are rare, but during the great magnetic storm and aurora of January 25th, 1938, one of 4° to the eastward was observed off the Portuguese coast. During a severe magnetic storm the compass may be deflected continually in one direction to the extent of about half a degree for some hours. When bright aurora is seen, especially if it is of the more deeply coloured and rapidly moving kind, and particularly when it is observed in low latitudes, the possibility of deflections of the compass should always be borne in mind.

During a considerable magnetic storm freak wireless reception may occur on certain waves and short-wave transmission may fade to complete silence. Beam radio communication, especially in a west-east or east-west direction, may be interrupted. Such conditions may last in some degree over a period of several days, at times when the sun is unusually active. Short-wave fading also occurs occasionally from a different form of solar disturbance known as a " bright eruption," when this is very intense. On the average such fading begins about 7 minutes after occurrence of the bright eruption and may last 5 or 10 minutes, gradually returning to normal within a period of 40 to 45 minutes. These fadings are confined to the daylight hemisphere of the earth, while the magnetic storm fadings may occur by day or by night.

GENERAL METEOROLOGY.

(All the following articles do not apply to every Pilot, but articles applicable to this Pilot will be referred to in the Climate and Weather Section in Chapter I.)

(1) **Lows.**—A low, or depression, appears on a synoptic chart as a series of isobars roughly circular or oval in shape, surrounding an area of low pressure. It is a main feature of the weather at sea in middle latitudes where it is responsible for most of the occasions of strong winds and unsettled weather, though not all depressions are accompanied by strong winds.

Lows vary very much in size and depth ; one may be only a hundred miles in diameter and another over two thousand miles ; some are deeper than others, a deep low being one in which the pressure is very much lower near the centre than on the outside whereas, on the other hand, a shallow depression is one where the pressure, although low near the centre, is not very much lower than in the surrounding districts.

Note.—The bracketed equivalents hereunder refer to the Southern Hemisphere.

In the northern (southern) hemisphere the winds blow round an area of low pressure in an anti-clockwise (clockwise) direction ; there is also a slight inclination across the isobars towards the lower pressure. Thus the well-known rule for the northern (southern) hemisphere is that when an observer faces the wind the direction of the lowest pressure is from 8 to 12 points to his right (left). The strength of the wind is in all instances closely related to the steepness of the barometric gradient or distance apart of the isobars ; the closer the isobars the stronger the wind.

Lows may move in almost any direction, though most often towards north-east (south-east) or east, at a speed of anything between 10 and 40 knots, though occasionally as much as 60, during the middle and most active stage of their existence ; they slow down when filling up (*see* "occlusion" below). The life of a low is in the region of 4 to 6 days.

There are usually one or more fronts, probably radiating from the centre, in the area covered by a low; each front on a synoptic chart represents a belt of relatively bad weather, accompanied by a veer (backing) of wind, which marks the change from the weather characteristic of one air mass to that of another. During the first two or three days of its life a low has a warm and a cold front, the area between the two being known as a warm sector because the air has come from a warmer locality than that which is outside the sector (see Fig. 1*a*). Warm air is lighter than cold air and it rises over the cold air ahead of the warm front as shown in Fig. 1*b*; this causes condensation of the water vapour in the warm air, forming at first cloud and later drizzle or continuous steady rain. The cloud spreads out ahead of the warm front, and the highest cloud, cirrus or mares' tails, is often about 500 miles ahead. At the rear boundary of the warm sector, known as the "cold front," the cold air is pushing under the warm air forcing the latter to ascend rapidly; this process is sometimes violent enough to produce squalls. The rapid ascent of the warm air causes the moisture to condense in the form of cumulo-nimbus clouds (shower clouds), from which heavy showers may fall. The cold front gradually overtakes the warm front so that the warm sector is eventually lifted up from the earth's surface. When this has occurred the low is said to be occluded, and the warm and cold fronts have merged into the third type of front known as an "occlusion" (*see* Figs. 2*a* and *b*). When a low has become occluded, it usually decreases in intensity and rate of travel, and gradually fills up. On the other hand, a low which has a marked warm sector is likely to be deepening, the winds associated with it may increase in force and its rate of travel may increase. Lows are usually travelling in a direction approximately parallel to the isobars (and in the direction of the wind) in the warm sector.

The approach of a low is indicated by a falling barometer. In the northern (southern) hemisphere, if the low is approaching from westward and passing northward (southward) of the ship, clouds appear on the western horizon, the wind shifts to a south-westerly (north-westerly) or southerly (northerly) direction and freshens, the cloud layer gradually lowers, and finally drizzle, rain or snow begins. If the low is not occluded, after a period of continuous rain or snow there is a veer (backing) of wind at the warm front, a rise of temperature and diminution or cessation of rain (or snow) in the warm sector, the visibility being usually moderate and the sky overcast with low cloud. The passage of the cold front is marked by the approach from westward of a thick bank of cloud (which however cannot often be seen because of the customary low overcast sky in the warm sector), a further veer (backing) of wind to west or north-west (south-west), sometimes with a sudden squall, rising pressure, a fall of temperature, squally showers of rain, hail or snow, and improved visibility (except during showers). The squally showery weather with a further veer (backing) of wind and drop in temperature may recur while the low recedes owing to the passage of another cold front or occlusion. If the low is occluded, the occlusion is preceded by the cloud of the warm front; there may be a period of continuous rain mainly in front of and at the line of occlusion, or a shorter period of heavy rain mainly behind the occlusion, according as the air in front of the occlusion is colder or warmer than that behind it. There may be a sudden veer (backing) of wind at the occlusion.

Often another low follows 12 to 24 hours later, in which event the barometer begins to fall again and the wind backs towards south-west (north-west), or even south (north).

If a low travelling eastward or north-eastward (south-eastward) is passing southward (northward) of the ship, the winds in front of it are easterly and they back (veer) through north-east (south-east) to north (south) or north-west (south-west); changes of direction are not likely to be so sudden as on the southern (northern) side of the low. In the rain area there is often a long period of continuous rain and unpleasant thick weather with low cloud. In winter in the colder regions the weather is cold and raw and precipitation is often in the form of snow.

Near the region of lowest pressure, lulls are sometimes experienced, but sudden changes are likely, and in a deep low the wind may increase in strength very rapidly, perhaps to gale force as the barometer begins to rise.

Sometimes in the air circulation of a large low, usually on the equatorial side and often on a cold front, a secondary depression develops, travelling in the same direction as the primary but usually more rapidly. The secondary often deepens while the original low decreases in intensity. In the region between the primary and the secondary depressions, the winds are not as a rule strong; but on the farther side of the secondary, usually the southern (northern) side, winds are likely to be strong and they may reach gale force. Thus the development of a secondary may cause gales at a greater distance from the primary than anticipated, while there may be only light winds where gales were expected.

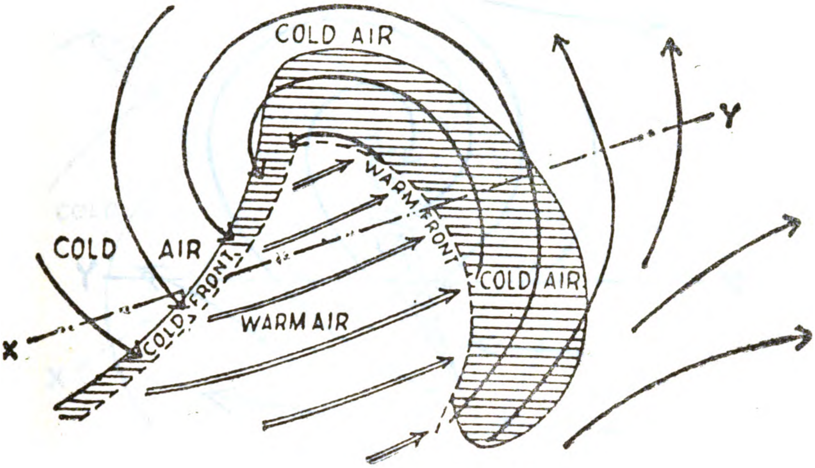
The above is a brief general description of lows and the associated weather in temperate or middle latitudes of the northern (southern) hemisphere. It must be emphasised, however, that individual lows in different localities differ considerably from one another, according to the characteristics (especially the temperature and humidity) of the air currents of which they are composed, and the nature of the surface over which they are travelling.

(2) Tropical revolving storms.—*Practical rules for avoiding them.*—These storms are so named because the wind blows round an area of low pressure situated at the centre. The direction of rotation is anti-clockwise in the northern hemisphere and clockwise in the southern hemisphere. The wind does not revolve round the centre of the low pressure in concentric circles but has a spiral movement inwards, towards the centre.

A tropical storm is not so extensive as the depression of higher latitudes but, within 75 miles or so of the centre, the wind is often far more violent, and the high and confused seas near the centre may cause considerable damage to large and well-found ships, while small vessels (for example, destroyers) have foundered. The danger is still greater when ships are caught in restricted waters without adequate room to manœuvre. Due to torrential rain and sheets of almost continuous spray, visibility near the storm centre (but outside the "eye") is almost nothing. Within 5 to 10 miles of the centre the wind is light or moderate and variable, the sky is clear or partially so, and there is a heavy, sometimes mountainous, confused swell; this area is known as the "eye" of the storm.

Every ship navigating in an area subject to tropical storms, during the period of their occurrence, should be constantly on the alert for any sign of their approach, so that steps can be taken to avoid the danger zone while there is still time and sea-room.

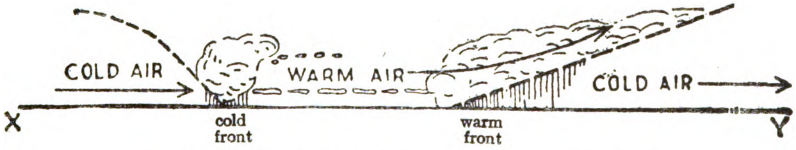
Fig. 1a.



Plan of a developed depression.

The double lines show the flow of the warm air, and the single lines the flow of the cold air.
The shading shows the areas where rain (or snow) is most probable.
Width of rain belt ahead of warm front is generally between 100 and 200 miles.

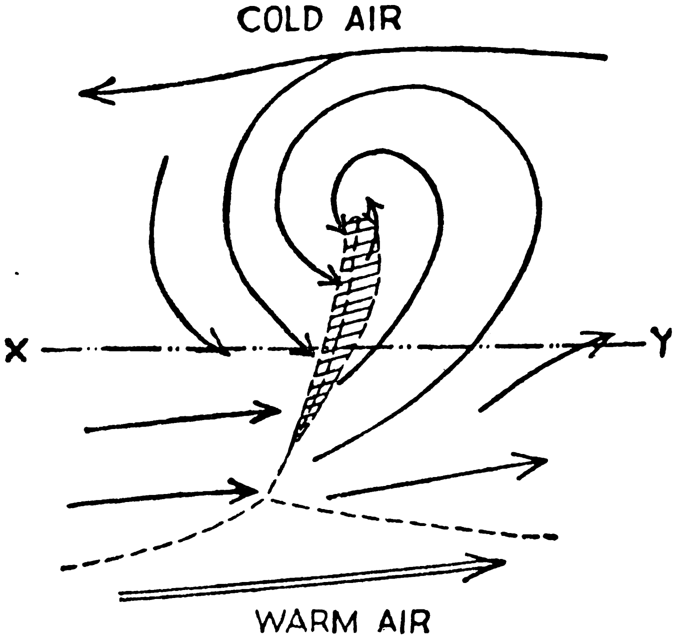
Fig. 1b.



Vertical section of the depression along the line XY.

[*See over page.*

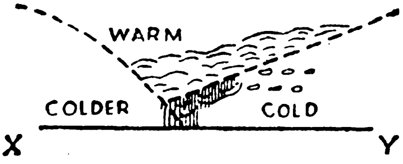
Fig. 2a.



Plan of an occluded depression.

The shading shows the region where rain (or snow) may be expected near the occlusion.

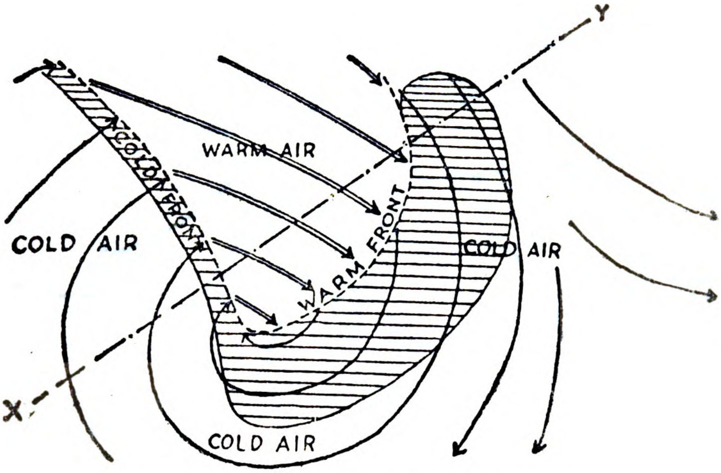
Fig. 2b.



Vertical section of an occlusion of the cold front type.

The air in front of the occlusion is warmer than the air behind it.

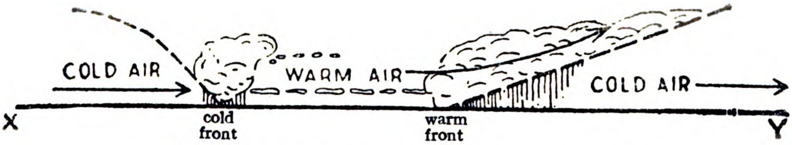
Fig. 1a.



Plan of a developed depression.

The double lines show the flow of the warm air, and the single lines the flow of the cold air.
The shading shows the area where rain (or snow) is most probable.
Width of rain belt ahead of warm front is generally between 100 and 200 miles.

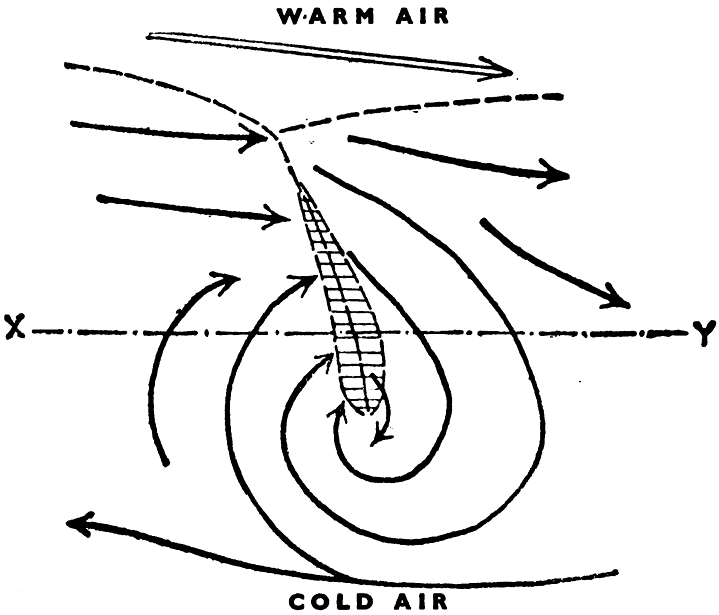
Fig. 1b.



Vertical section of the depression along the line XY.

[*See over page.*

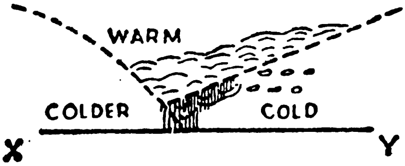
Fig. 2a.



Plan of an occluded depression.

The shading shows where rain (or snow) may be expected near the occlusion.

Fig. 2b.



Vertical section of an occlusion of the cold front type.

The air in front of the occlusion is warmer than the air behind it.

Localities, season, and average frequency.—Tropical storms occur for the most part on the western side of the oceans, though they are also experienced in the Bay of Bengal, off the north-west coast of Australia, and off the west coast of Central America. They are unknown in the South Atlantic. They are given various names according to the part of the World in which they occur.

Western North Atlantic	—hurricanes
Eastern North Pacific	
South Pacific	
Western North Pacific	—typhoons
Indian Ocean	—cyclones
Bay of Bengal	
Arabian Sea	
North-west Australia	—willy-willies

They are most frequent during the late summer and early autumn of their hemisphere; they are comparatively rare in the southern hemisphere from mid-May to November, and in the northern hemisphere from mid-November to mid-June. In the Arabian Sea, however, storms are most likely to occur at the change of the monsoon, i.e. October–November, and May–June, though they average only one or two a year. Out-of-season storms occur from time to time, particularly in the western North Pacific, where no month is entirely safe, and in the Indian Ocean, where one is reported south of the Equator perhaps once in two years outside the usual season. The following table shows approximately the average number of severe tropical storms recorded in 10 years in the several areas:

West Indies	50
Western North Pacific	250
„ South Pacific	30
Southern Indian Ocean	60
Bay of Bengal	20
Arabian Sea	10
Eastern North Pacific	30
West Coast of Australia	10

Variations in any one year amounting to 50% above or below the average are not unusual. Some of the figures quoted may be an under-estimate since in the less-frequented parts of the world some storms may have escaped detection.

Origin, movement and extent.—Tropical storms originate as a general rule in the doldrums, between the parallels of 7° and 15° of latitude; those which affect the western part of the Pacific, South Indian and North Atlantic Oceans are first reported in the western third of those oceans, though there are exceptions such as in the North Atlantic during August and September where an occasional storm is known to begin near the Cape Verde islands. In the northern hemisphere they move off in a direction between 275° and 350°, though most often within 30° of due west. When in a latitude of 25° or so they usually recurve away from the equator and, by the time they have reached the 30th parallel, the track (or path as it is more usually called) is north-easterly. In the southern hemisphere they move off in a WSW. to SSW. direction (usually the former), recurve at about 15° to 20° S., and thereafter adopt a south-easterly path. Many storms, however, do not recurve but continue in a west-north-westerly (or west-south-westerly) direction until they reach the mainland, where they quickly die.

The speed of these storms is usually about 10 knots in their early stages, increasing a little with latitude; it seldom exceeds 15 knots before recurving, but thereafter 20 to 25 is usual, though speeds of 40 knots or even more have been known.

Occasionally storms move erratically, the path turning towards the equator, or adopting an easterly component in a low latitude, or even making a complete loop, but on these occasions its speed is low, usually less than 10 knots, while the unusual path is being followed.

The extent of the storm area varies considerably with individual storms, but generally speaking, winds of force 7 or more are improbable at more than 200 miles (especially on the equatorial side of the storm area), and force 8 unlikely to be exceeded at more than 100 miles, from the storm centre, at a latitude of less than 20°. Thereafter the radius increases with latitude so that these distances are nearly doubled on reaching the 35th parallel, but the intensity diminishes near the centre. Hurricane force winds are likely within 75 miles of the storm centre in the tropics, and gusts exceeding 150 knots have been reported in a few instances within 50 miles or so (except in the eye of the storm).

Warning of existence or approach.—In most instances, warning of the position, intensity and probable movement of a storm is given by radio at frequent intervals. (*See* Admiralty List of Radio Signals, Volume III.) Sometimes, however, there is insufficient evidence available for an accurate warning, or even a general warning, to be given, and ships must then be guided by their own observations. Of the following indications of the proximity of a tropical storm, the first is by far the most reliable within 20° or so of the equator; it should be borne in mind, however, that very little warning of the approach of an intense storm of unusually small diameter may be expected.

(*a*) If the corrected barometer reading is 3 mb. or more below the mean for the time of year, as shown in a climatic atlas or on the appropriate chartlets in the meteorological text of this Pilot, suspicion should be aroused and action taken to meet any development, such as raising steam in any available additional boilers, &c. It should be noted, however, that the barometer reading must be corrected not only for height, latitude, temperature and index error (if mercurial), but also for diurnal variation, the amount of which is given for each hour of the day in the Air Ministry climatic atlases and in the meteorological text of this Pilot. If the reading thus corrected is 5 mb. or more below normal, it is time to take avoiding action for there can be little doubt that a tropical storm is in the vicinity. According to an analysis of observations in the Western Pacific the centre of the storm is probably not more than 200 miles away. At this distance, at any rate in the China Sea vicinity, the wind has usually increased to about force 6.

When proceeding through an area liable to be visited by these storms it is desirable to take hourly readings of the barometer.

(*b*) An appreciable change in the direction and/or strength of the wind.

(*c*) A swell is sometimes evident, proceeding from a direction that approximates to the bearing of the centre. If ahead of the storm this indication may be apparent before the barometer begins to fall.

(*d*) Extensive cirrus cloud followed, as the storm becomes closer, by much alto-stratus cloud and subsequently fracto-cumulus or "scud."

(*e*) In addition there is the warning that can be given by Radar. Certain sets can display on the screen areas where moderate and heavy rain is falling. The greatest range to which this can be done at present is about 80 miles. Although moderate or heavy rain does not fall symmetrically all round a storm, it is continuous for at least 50 miles in a broad sector extending from the " eye " of the storm where there is a circular area of relatively light winds and clear or partially clear sky. By the time this final, and quite unmistakable, evidence of the exact position of the storm is available, the ship is already in fairly high seas, and is probably experiencing winds of force 9 or 10. It should be in time, however, to enable her to avoid the centre, on the edge of which conditions are worst of all.

Note.—In accordance with Article 35 of the International Convention for Safety of Life at sea it is the duty of every ship who suspects the presence or formation of a tropical revolving storm immediately to inform other vessels and shore authorities with all the means at her disposal. Weather reports should be made by radio at frequent intervals giving as much information as possible, especially corrected (*not* for diurnal variation as in (*a*) above) barometer readings. If barometer readings are uncorrected this fact should be stated in the signal.

Information required by the seaman before deciding upon action to be taken.—To decide on the best course of action if a storm is suspected to be in the vicinity, a seaman requires to know :—

(*a*) the bearing of the centre of the storm ;
(*b*) the path of the storm ;
(*c*) the semicircle in which the ship is situated.

If an observer faces the wind, the centre of the storm will be from 9 to 11 points on his right-hand side in the northern hemisphere when the storm is about 200 miles away, i.e., when the barometer has fallen about 5 millibars and the wind has increased to force 6 or thereabouts ; as a rule the nearer one is to the centre the more nearly does the angular displacement approach 8 points.

The path of the storm may be approximately determined by taking two such bearings with an interval of from two to three hours between observations, provided that allowance is made for the ship's movement. It can, however, be assumed that the storm is not travelling towards the equator ; and, if in a lower latitude than 20°, its path is most unlikely to have an easterly component ; and, on the rare occasions when neither of these statements applies, the storm is moving very slowly. (Exceptions to this are most likely in the South Pacific, where the occasional storms often move off on a course almost due south which develops an easterly component at a latitude of about 15°, and in the western North Pacific in the instance of some of the out-of-season storms which may recurve at an early stage.)

The diagram headed " Typical Paths of Tropical Storms " (at the end of this article) illustrates the terms " dangerous semicircle " and " navigable semicircle." The former lies on the side of the path towards the usual direction of recurvature, i.e., the right-hand semicircle in the northern and the left-hand semicircle in the southern hemisphere. It is so called because a sailing or low-powered ship caught in it may be blown towards the path along which the storm will pass, or the storm may recurve and the centre pass over her. The navigable semicircle is that which lies on the other side of the path. A ship situated within this semicircle will tend to be blown away from the storm centre, and the recurvature of the storm will increase her distance from the centre.

Practical rules for avoiding tropical storms.—In whatever situation a ship may find herself, the matter of vital importance is to avoid passing within 50 miles or so of the centre of the storm; it is preferable to keep outside a radius of 200 miles or more, because at this distance the wind does not often exceed force 7 (and is generally not more than force 6), and freedom to manœuvre is maintained. If a ship has at least 20 knots at her disposal, and shapes a course that will take her most rapidly away from the storm before the wind has increased above the point at which her movement becomes restricted, it is seldom that she will come to any harm.

Sometimes a tropical storm moves so slowly that a vessel, if ahead of it, can easily outpace it or, if astern of it, can overtake it. Since, however, she is unlikely to feel seriously the effects of a storm so long as the barometer does not fall more than 5 mb. (corrected for diurnal variation) below the normal, it is recommended that frequent readings should be made if the presence of a storm in the vicinity is suspected or known, and that the vessel should continue on her course until the barometer has fallen 5 mb., or the wind has increased to force 6 when the barometer has fallen at least 3 mb. If and when either of these events occurs, she should act as recommended in the following paragraphs, until the barometer has risen above the limit just given, and the wind has decreased below force 6. Should it be certain, however, that the vessel is behind the storm, or in the navigable semicircle, it will evidently be sufficient to alter course away from the centre.

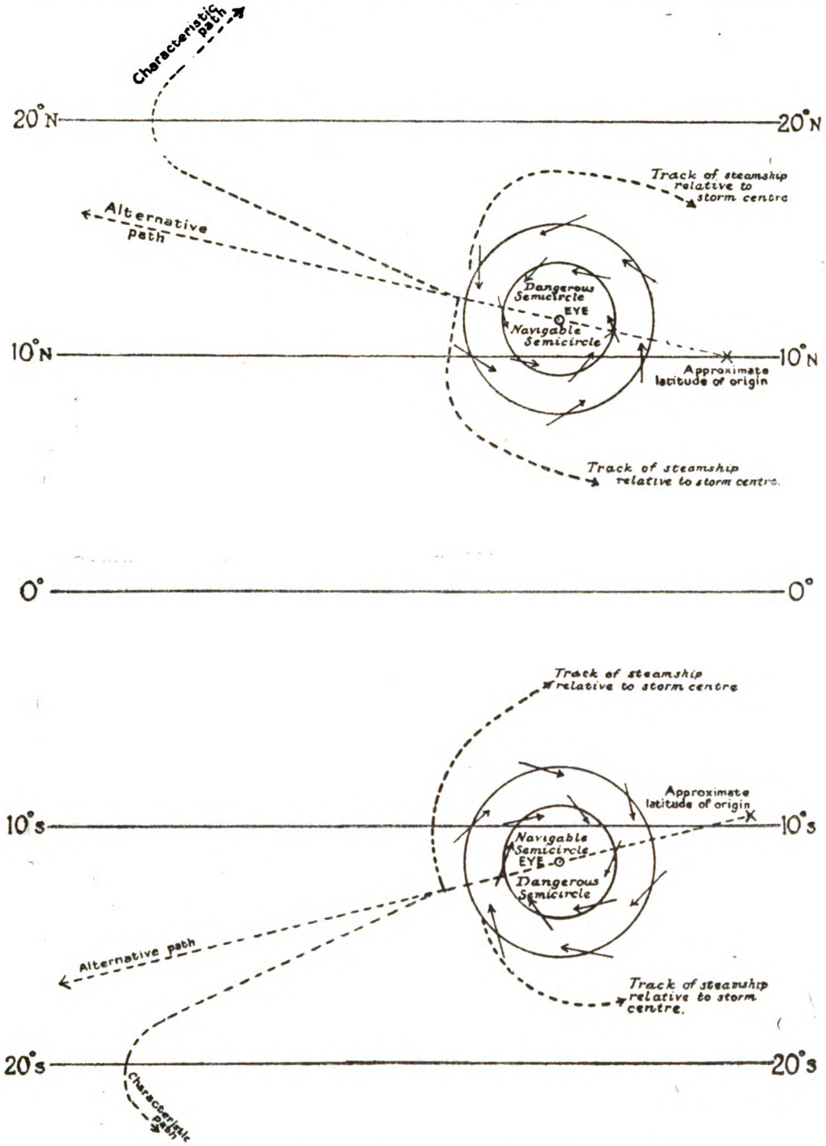
In the northern hemisphere.—(*a*) If the wind is veering, the ship must be in the dangerous semicircle. A steam or other power-driven vessel should proceed with all available speed with the wind 1 to 4 points (depending upon her speed) on the starboard bow. A sailing vessel should heave to on the starboard tack. Either type of ship should haul round to starboard as the wind veers, thereby tracing a course relative to the storm as shown by the pecked line in the diagram.

(*b*) If the wind remains steady in direction, or if it backs, so that the ship seems to be nearly in the path (it is sometimes difficult to determine satisfactorily if indeed the ship is nearly in the path, particularly if in the dangerous semicircle, because the wind does not always behave according to rule) or in the navigable semicircle respectively, a steam vessel should bring the wind well on the starboard quarter and proceed with all available speed. A sailing vessel should run with the wind on the starboard quarter. Either type of ship should alter course to port as the wind backs, thus tracing a course relative to the storm as shown by the pecked line in the diagram.

In the southern hemisphere.—(*a*) If the wind is backing, the ship must be in the dangerous semicircle.—A steam or other power-driven vessel should proceed with all available speed with the wind 1 to 4 points (depending upon her speed and that usual for a storm in this latitude) on the port bow. A sailing vessel should heave to on the port tack. Either type of ship should haul round to port as the wind backs, thereby tracing a course relative to the storm as shown by the pecked line in the diagram.

(*b*) If the wind remains steady in direction, or if it veers, so that the ship seems to be nearly in the path (it is sometimes difficult to determine satisfactorily if indeed the ship is nearly in the path,

TYPICAL PATHS OF TROPICAL STORMS


Characteristic path
20°N
20°N
Alternative path
Track of steamship relative to storm centre
Dangerous Semicircle
EYE
Navigable Semicircle
10°N
10°N
Approximate latitude of origin
Track of steamship relative to storm centre.
0°
0°
Track of steamship relative to storm centre
Approximate latitude of origin
10°S
10°S
Navigable Semicircle
EYE
Dangerous Semicircle
Alternative path
Track of steamship relative to storm centre.
20°S
20°S
Characteristic path

Note.—In this diagram the isobars are shown as concentric circles about the eye; in practice this is usually the case within 150 miles or so of the centre. Outside this distance the isobaric form often loses its symmetry and strong winds often extend farther on the polar side than on the equatorial.

particularly if in the dangerous semicircle, because the wind does not always behave according to rule) or in the navigable semicircle respectively, a steam vessel should bring the wind well on the port quarter and proceed with all available speed. A sailing vessel should run with the wind broad on the port quarter. Either type of ship should alter course to starboard as the wind veers, thus tracing a course relative to the storm as shown by the pecked line in the diagram.

If there is insufficient room to run, when in the navigable semicircle, and it is not practicable to seek shelter, a vessel should heave to with the wind on the starboard bow in the northern hemisphere, and on the port bow in the southern hemisphere.

If in harbour, or at anchor, a seaman should be just as careful as at sea in watching the shifting of the wind and estimating the movement of the storm relative to himself, as by so doing he will be able to shift his berth with advantage or otherwise act according to circumstances. It is far preferable, however, to put to sea, if this can be done in sufficient time to avoid the worst of the storm. Riding out a tropical storm, the centre of which passes within 50 miles or so, in a harbour or anchorage, even if some shelter is offered, is an extremely unpleasant and hazardous experience, especially if there are other ships in company. Only if berthed alongside, or if special moorings and long bridles are used, can a ship feel secure.

Discretion must, of course, be used. In the case of a low-powered or small vessel with, for example, insufficient warning to enable her to gain sufficient distance from the storm by putting to sea, it will be preferable to remain in a reasonably sheltered harbour. If at sea and warning of an approaching storm is given and there is considered to be insufficient time or sea room to avoid the dangerous part of the storm area, it may be advisable for vessels of this type to seek shelter. In the China Sea, for example, there are so-called typhoon harbours which are listed in the Admiralty Pilot. In all cases, however, the seaman must use seamanship and initiative.

(3) **Local modification of the weather near the coast.**—The information given in Chapter I on climate and weather in the area covered by the Pilot refers necessarily to the coastal and sea regions generally but cannot attempt to deal with the local effects on the wind and weather of each separate headland, bay, or creek. The following notes, however, should prove helpful in showing how the weather in the general vicinity is likely to be modified by the topography or shape of the land close to the actual place in which the mariner is concerned.

(i) If the coastline is steep-to, onshore winds that approach it at an angle are usually deflected nearly along the shore and increased somewhat in speed. And when the wind approaches a strait whose direction is somewhat similar to that of the wind, the wind tends to blow along the strait and increases in speed as the strait narrows.

When a strong wind blows directly towards a very steep coast, there is usually a narrow belt of contrary gusty winds close to the coast.

(ii) Similarly when the wind blows onshore towards the entrance to a wide estuary, especially one with hills on both sides, it generally tends to blow up the estuary. This effect is most marked in the afternoon but there is often no such tendency during the night and early morning.

(iii) An offshore wind is often squally on the lee side of hilly coasts, especially when the air is much colder than the sea, as for example when it blows off snow-covered land and when the wind over the open sea is force 5 or more.

(iv) Near headlands or islands with steep cliffs there may be large changes in direction (up to about 90°) and speed of the wind in addition to those mentioned above.

(v) During quiet and warm weather with clear or fairly clear skies, a sea breeze is of common occurrence during the warmer part of the day; it is especially frequent in the tropics and subtropics. It blows onshore from, on the average, 4 to 8 hours after sunrise until shortly before sunset, reaching its maximum development during the afternoon (1300 to 1600); if there is an appreciable regional or general wind, then this will be modified by the onshore sea breeze. Under particularly favourable circumstances such as high day temperatures, relatively cool sea, and hilly background to coast, the sea breeze may blow as much as force 4 (occasionally 5) and extend 20 miles or more to seaward from the shore. At night under similar circumstances a lighter breeze blows from the land to the sea; it seldom extends more than 5 miles from the shore nor does it become appreciable much before 2200 local time; under favourable conditions, as in the tropics, it usually lasts until an hour or so after sunrise.

(vi) When sea fog that is caused by the passage of warm air over a colder sea surface is general over the open sea, visibility is better close to leeward of a hilly island or promontory than to windward. This effect is most marked in late spring and summer, during the early afternoon when the land is at its warmest, and this applies to low-lying land as well.

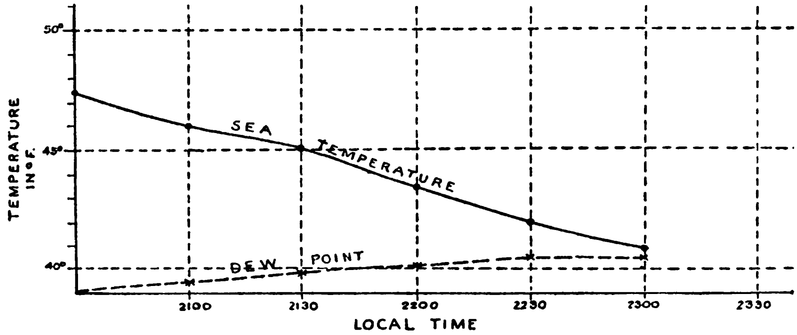
(vii) Radiation fog which forms over land on quiet nights with clear skies, mainly in autumn and winter, and sometimes spreads a few miles out to sea, is least thick during the afternoon and is often worst during the first hour or two after sunrise.

(4) **Forecasting sea fog.**—The most frequent type of fog in the open sea is that caused by relatively warm air flowing over a colder sea. Warning of this type of fog may be obtained by frequent observations of air and sea surface temperatures; if the sea temperature falls below the dewpoint of the air, fog is almost a certainty. The following procedure is recommended whenever the temperature of the air is higher than, or about equal to, that of the sea, especially at night when approaching fog cannot be seen until shortly before entering it.

Sea and air (both dry and wet bulb) temperatures should be observed at intervals of about 5 miles and the sea temperature plotted against dewpoint. The dewpoint is obtainable from tables published in various text-books, but at temperatures up to about 60° F. a close enough approximation may be obtained by assuming it to be the same amount below the wet-bulb temperature as the latter is below the dry-bulb temperature; for example, if the dry bulb reads 50° F. and the wet bulb 48°, the dewpoint is about 46°. If the curves of sea temperature and dewpoint converge, fog may be expected by the time at which they coincide.

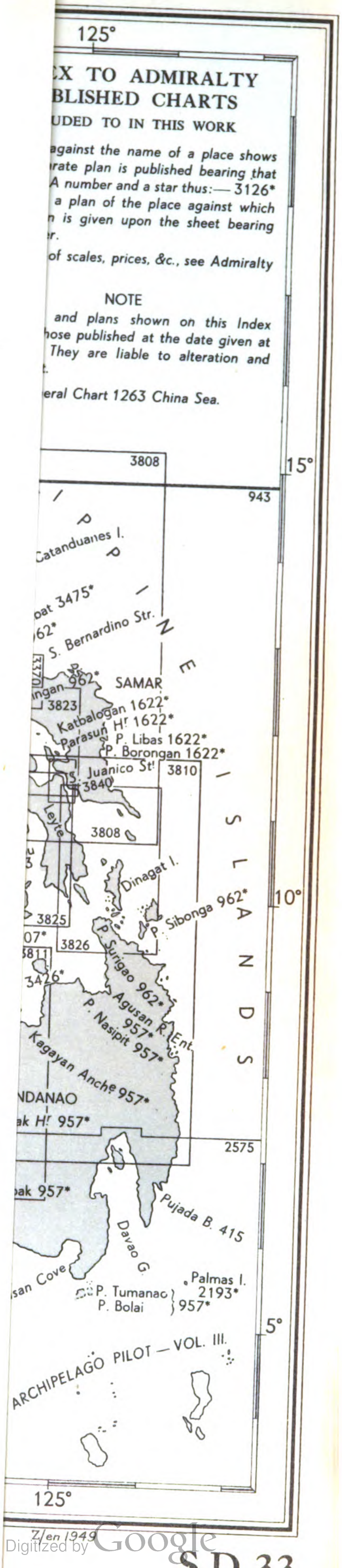
The figure below represents conditions that might be found by a low-powered ship in about long. 40° W. proceeding westward on the appropriate lane route for Halifax, Nova Scotia. At 2200 it would become evident that there is a probability of running into fog in about an hour's time, assuming that the sea temperature continues to fall at about the same rate that it has done during the last 1½ hours.

From the appropriate chart of average sea surface temperatures it can be seen where a rapid fall of temperature may be expected, so that if the dewpoint is within 5° or so of the sea temperature when approaching the colder water zone, this will also give a fairly reliable warning of fog.



If it is desirable and practicable to escape from fog, a ship should steer for warmer water which will again be evident from the charted isotherms.

Fog, or very poor visibility, at sea may also occur in snow or heavy rain, or in association with the passage of a warm front or occlusion, or, when within 20 miles or so of land, it may occur as a result of radiation fog extending from the land; in high latitudes in winter, sea smoke may be met near land, when very cold offshore winds are blowing, or near extensive ice. The method described above will not give warning of these fogs, of which frontal fogs, though common in middle latitudes, are neither so extensive nor so persistent in any one locality, and the other fogs mentioned are rarely encountered far from land (or extensive ice).



Z/en 1949

S.D. 33

IMPORTANT.

Details of Lights, Fog Signals, and Time Signals (visual) are not included in this volume: for this information the Admiralty List of Lights, Vol. 6, should be consulted.

Information regarding Vertical Movement of the Water is not included ; for this the Admiralty Tide Tables should be consulted.

Details of Radio information (weather bulletins, storm and navigational warnings, time signals, fog signals, and D.F. stations) are not included ; for this information the Admiralty List of Radio Signals should be consulted.

EASTERN ARCHIPELAGO PILOT, VOL. I

PHILIPPINE ISLANDS, SULU SEA AND ARCHIPELAGO, AND N.E. COAST OF BORNEO

CHAPTER I

PHILIPPINE ISLANDS—SULU ARCHIPELAGO—BORNEO—STATE OF NORTH BORNEO—SULU SEA—CURRENTS—TIDAL STREAMS—SIGNALS—SUBMARINE CABLES—RADIO STATIONS—AIR LIGHTS—REPAIRS—COAL AND FUEL OIL—STANDARD TIME—PASSAGES—CLIMATE AND WEATHER—CLIMATIC TABLES

PHILIPPINE ISLANDS.—The Philippine islands, situated in the northern part of the East Indian archipelago, were discovered by the Portuguese navigator Fernando de Magalhaens in 1521, and were formally annexed to Spain in 1565. They were ceded to the United States of America in 1898. On the 14th November, 1935, the President of the United States of America signed a proclamation establishing the new Philippine Commonwealth, and certifying the election of its first President. On 4th July, 1946, the Philippine islands became a Republic.

The Philippines, together with the Sulu archipelago, comprise over 7,000 islands, of a total area of about 115,600 square miles, and lie approximately between lat. 5° and 20° N. and long. 116° and 127° E. Luzon, in the north, and Mindanao, in the south, are the two largest islands of the group; of the remainder the most important are Samar, Negros, Panay, Palawan, Mindoro, Leyte, Cebu, Bohol, and Masbate.

Physical features.—The Philippine islands are generally mountainous and densely wooded, and contain several volcanoes. Mount Apo, 9,690 feet (2,953^{m}5) high, in Mindanao, and Mount Pulog, 9,480 feet (2,889^{m}5) high, in Luzon, are probably the highest points.

The principal rivers in the Philippines are the Cagayan (Kagayan), Agno, Pampanga, Pasig, and Bicol (Bikol) in Luzon, and the Mindanao and Agusan in Mindanao.

Flora.—The flora is essentially Malaysian, but Himalayan elements occur in the mountains of northern Luzon, while a few Australian types are found at various altitudes. The dominant forest species are usually endemic. The vegetation of the coastal regions, including the mangrove swamps, is practically identical with that of similar areas throughout the Malay archipelago. Considerably more than half the land area of the islands is covered with forests. There are many valuable hardwoods as well as many of the softer variety. Some timber trees attain a large size. There are many useful kinds of palms; useful bamboos and rattans abound. The forests yield gums, including rubber, various fruits, nuts, spices and drugs.

Fauna.—Mammals are scarce, with the exception of shrews, rats, mice and bats. Red or brown deer are found in Basilan, Mindanao, Leyte, Samar, and the Calamian islands. The timarau, a small buffalo, is peculiar to Mindanao. Carnivores are represented by the mongoose, the binturong, otter, and civet cats. The flying lemur and tarsiers range from Basilan to southern Luzon. Only one genus of monkey has been found, but it is represented by five species.

There are about 760 species of birds. Reptiles also abound. The marine fauna is one of the most abundant known, more than 1,000 species having been found, three-quarters of which at least are edible. The Philippines have the richest molluscan fauna of any equal area in the world, and many of the shells are of great beauty. Pearl oysters abound, and the pearls of the Sulu archipelago have an international reputation.

Earthquakes.—Earthquakes of the most severe description have been experienced; the earliest recorded took place in 1610; that of 1796 was sadly calamitous. In 1824 many churches in Manila were destroyed, together with the principal bridge and numbers of houses, and a chasm opened 4 miles in length. The most disastrous of recent times was that of 1863, when 400 persons were killed and 2,000 injured in Manila, and 46 public buildings and 1,100 private houses were seriously damaged or destroyed. Others occurred in 1645, 1658, 1675, 1699, 1828, 1832, 1852, 1869, and 1880, when there were terrible shocks of earthquake, and in 1891, in the province of Panga Sinan, earthquakes were continually repeated during a period lasting a month. In 1897 was the destructive eruption of Mayon. In 1911 there was an explosion of gas in the crater of Taal volcano, devastating the country surrounding Lake Taal. Active volcanoes exist in the Babuyan islands, Luzon, Negros, and Mindanao.

Government.—The Republic of the Philippine islands is governed by a constitution adopted on 14th May, 1935 and amended in 1940. The President and Vice-President are elected for 4 years, assisted by 11 departmental Secretaries. The Legislature consists of a Senate of 24 members and a House of Representatives of 98 members, elected in 1946.

Population.—In 1948, the population of the Philippine islands was 19,234,182, of whom about 80 per cent. are Roman Catholics.

Products.—The chief products are rice, Manila hemp, copra, sugar cane, maize, tobacco and maguey. The principal fruit is the banana; there are also mangoes, papaya, chico and oranges.

Coal is found in Batan island, Cebu, Polillo, Mindanao, Mindoro and Masbate. Metallic minerals include chromite, copper, gold, iron, manganese, lead, zinc, and silver. Gold deposits are found in the province of Camarines Norte, near Baguio, in Masbate and Mindanao.

Trade.—The principal exports are sugar, coconut oil, hemp, copra, tobacco products, and embroideries. The chief imports are cotton goods, iron and steel manufactures, meat and dairy products, flour, and silk goods.

Currency.—The Philippine peso is equivalent to fifty cents of the United States dollar. The coins in use are the peso, half peso, peseta (20 centavos), media peseta (10 centavos), all in silver; 5 centavos, in nickel; one centavo, in bronze. Bank notes are in 1, 2, 5, 10, 20, 50, 100, and 500 pesos.

Ports of entry.—The ports of entry included in this volume are Jolo (Holo), Zamboanga, Davao, Iloilo, Cebu (Sebu) and Legaspi.

Ports open to foreign shipping.—The following ports are open to foreign shipping:—Jolo, Zamboanga, Davao, Iloilo, Cebu, Aparri, Jose Panganiban (Mambulao) and Legaspi.

The following ports, which have no Customs facilities, are open to foreign shipping with a special permit by the Collector of Customs:—Pulupandan, Hondagua, Tabaco.

Communications.—There is regular communication by steamer between all the principal ports of the Philippines.

There are 563 miles of railways in the islands of Luzon, Panay, and Cebu, of which 490 miles were in Luzon. For details *see* under the respective ports in the body of the book.

There is regular communication, by air, between Iloilo and Davao, Bacolod and Cebu.

The principal islands in the Philippines are in telegraphic communication with each other and with Manila by submarine cables, whence connection is made with the universal telegraph system. Numerous telephone systems are also maintained.

System of buoyage.—All buoys laid down in the Philippine islands are painted in accordance with the system in the United States, as follows:—

In approaching a channel from seaward, red buoys with even numbers will be found on the starboard side, and black buoys with odd numbers on the port side.

Middle ground buoys will be painted with red and black horizontal bands, and may be passed on either hand; those conical in shape are recommended to be left on the starboard hand and those can-shaped on the port hand.

Mid-channel buoys will be painted with black and white vertical stripes, and must be passed close-to in order to avoid danger.

Isolated danger buoys will be painted in red and black horizontal bands and may be can-shaped or some other shape.

Perches, with balls, cages, &c., will, when placed on buoys, be at turning points, the colour and number indicating on which side they should be passed.

Different channels in the same bay, sound, river, or harbour will be marked as far as practicable by different descriptions of buoys. Principal channels will be marked by conical buoys; secondary channels with can buoys; and minor channels with spar buoys. When there is but one channel, conical buoys properly coloured and numbered are usually placed on the starboard side and can buoys on the port side of it.

Day beacons, stakes, and spindles (except such as are on the sides of channels, which will be coloured like buoys) are constructed and distinguished with special reference to each locality, and particularly with regard to the background upon which they are projected.

In some localities the channels may be marked by " Lazy Vee " beacons which consist of beacons surmounted by the letter " V " with its axis horizontal; such beacons are arranged in pairs on each side of the channel, the points of the V's being toward the channel.

For vessels entering channels or rivers, *red* lights are on the right or starboard side of a channel and *white* or *green* lights on the left or port side. This is the reverse of the system previously used throughout the Philippines.

Harbour regulations.—The following are extracts from the harbour regulations for the harbours of the Philippine islands:—

1. All vessels on entering any port of entry or harbour shall show their colours and signal their official numbers or letters and keep them flying until boarded by the proper officials.

2. All vessels entering a harbour shall be considered in quarantine until boarded by the quarantine officer and given pratique by him. Until pratique is given the prescribed quarantine flag shall be kept flying at the fore.

3. All orders of the harbour master in connection with the berthing or movement of vessels shall be at once carried out by the master or other officer in charge of the vessel to which such orders relate.

4. All cases of sickness of a contagious or infectious character which may occur while the vessel is in port must be at once reported in writing to the quarantine officer.

5. Every vessel arriving in a port, having on board inflammable or explosive cargo, shall hoist a red flag at the fore truck, and shall keep such flag flying during the hours of daylight while any such cargo is on board, and shall display by night one *red* light at a height of not less than 20 feet ($6^{m}1$) above the deck. Such vessel shall anchor where indicated by the harbour master, and shall not change anchorage without his permission.

6. Should a pilot be required by any vessel, a regularly licensed pilot shall be furnished upon the display of the proper signal or upon application being made at the pilot station. Signal by day:—the pilot signal "PT" or flag "G" of the International Code of Signals; by night:—a *blue* light *every fifteen minutes* or a bright *white* light flashed or shown at short intervals just above the bulwarks, for about *one minute* at a time, or the signal "PT" in the Morse code made by flashing lamp.

7. No refuse or other matter which might impede or obstruct navigation or cause an obstruction thereto shall be thrown from any vessel or floating craft of any kind into the waters of any of the above harbours or into the navigable waters or any river tributary thereto.

8. Steam vessels towing shall have the right of way over steam vessels not towing; provided, that steamers of over 10 feet ($3^{m}0$) draught shall have the right of way in deep and narrow channels. In carrying out the rules for right of way, due regard shall be had to the fact that a vessel going against the tide or current is much more manageable than one going with it.

Deratisation.—In accordance with Article 28 of the International Sanitary Convention of 21 June, 1926, Deratisation can be carried out, and Deratisation and Deratisation Exemption Certificates can be issued to vessels at the following ports in the area covered by this volume:—

Zamboanga, Iloilo and Cebu.

SULU ARCHIPELAGO.—The Sulu archipelago, comprising more than 300 islands, lie between the north-east coast of Borneo and the south-western end of Mindanao. For further details, *see* page 189.

These islands were ceded by Spain to the United States of America in 1898, but till then had really been in the hands of native Malay or Arab chiefs, the influence of the Spaniards having been confined to the coastal ports. The archipelago now forms part of the Republic of the Philippine islands, *see* page 1.

The inhabitants, over 300,000 in number, are Muhammadans, of Malay race, speaking a Malay dialect, which they write in the Arabic characters. They are considerably advanced in civilisation, and are engaged in cultivating rice, fishing, and rearing horses, cattle, and poultry. There are several rubber plantations on Basilan island.

The principal articles of commerce furnished by the islands are tortoise-shell, trepang, and edible birds' nests, besides pearls and pearl shell.

There is regular steamer communication between Jolo and Zamboanga, Sandakan, and Singapore.

BORNEO.—Borneo is the largest island in the East Indian archipelago. Chains of mountains traverse its length; the main range, from 5,000 to 6,000 feet (1,524^{m}0 to 1,828^{m}8) high, terminates in Kinabalu, a mountain 13,455 feet (4,101^{m}1) high, situated about 60 miles from the northern extremity of the island. There are several other ranges of mountains.

Its vast interior consists of almost impenetrable virgin forest or jungle, teeming with animal life, but sparsely populated by man. The soil is fertile, and in some parts near the coast is marshy.

The greater part of the island is under the sovereignty of the Netherlands, along the coast of which they maintain establishments. The territories of Saráwak, Brunei, and British North Borneo extend over and along the north-west, north, and north-eastern coasts.

The total population is estimated at nearly 2,000,000. The productions are many and varied, and its mineral resources are believed to be great. The Chinese, who have been settled in most of the towns in Borneo for generations, conduct all the trading operations. The natives are of the Malayan type.

STATE OF NORTH BORNEO.—This State, formerly known as Sabah, situated at the north-eastern end of Borneo, has a coast-line of about 800 miles. The chief geographical feature in the territory is the Kinabalu mountain. The territory of North Borneo was acquired from the Sultans of Brunei and Sulu by cession for a small annual payment in 1879–80, and the British North Borneo Company was incorporated by Royal Charter, in 1881. In May, 1888, the British Government formally extended protection to the State of North Borneo.

The area of the State is 29,382 square miles, and includes the whole northern portion of the island of Borneo to Sibetik island on the east coast, in lat. 4° 10′ N.

The population was 312,374 in 1947, consisting mainly of aboriginal tribes and Muhammadan and Chinese settlers.

The climate, for a tropical country, is equable and healthy.

Harbours.—The principal harbours are those of Jesselton on the west coast (*see* China Sea Pilot, Vol. II), Kudat on the north coast, Sandakan, Lahad Datu, and Tawau on the east coast. The rivers are small.

Government.—The Government is administered by a Governor aided by a nominated Advisory council of 20 members, of whom

7 are Europeans; there is also an executive committee, consisting of 6 officials and 4 unofficials.

Trade.—The principal exports are rubber, timber, copra, dried and salt fish, cutch, jungle produce, tobacco, Manila hemp, sago, rice, damar and rattans.

The principal imports are rice, flour, cloth, provisions, tea, bran, opium, ironware, kerosene, sugar, petrol, spirits, wines, and medicines.

Communications.—There is regular communication by steamer between Sandakan, Kudat, Jesselton, Labuan and Singapore. There are regular sailings to Hong Kong and Jolo. A service is also maintained between Dutch Borneo and Tawau.

The State of North Borneo is connected to the general telegraph system of the world, and there is general telephonic communication throughout the State.

Currency.—The Government issues its own copper coinage (cents and half cents), nickel coinage of 1, 2½ and 5 cents, and silver coinage of 25 cents; also notes of the value of 1, 5, 10 and 25 dollars, and of 25 and 50 cents.

Weights and measures.—The commercial weights are:—

1 kati = 16 tahil = 1⅓ lbs. avoirdupois.
1 pikul = 100 kati = 133⅓ lbs. avoirdupois.
1 koyan = 40 pikul = 5,333⅓ lbs. avoirdupois.

The kati of 1⅓ lbs. is known as the Chinese kati (catty).

The measures of capacity are the gantang or gallon, the chupak or quart and the leng or pint.

The measure of length is the English yard, with its divisions and multiples, and land is measured by the English acre. The native terms are, however, still in use.

SULU SEA.—The area included between the Sulu archipelago and Mindanao on the south-east, Palawan on the north-west, the north-east coast of Borneo on the south-west, and the islands of Negros, Panay, and Mindoro on the north-east, is known by the name of the Sulu sea. Although of great depth (over 3,000 fathoms ($5,486^{m}4$) in the south-eastern part), this sea, which is connected with the China and Celebes seas, and also with the Pacific ocean by San Bernardino and Surigao straits, has a minimum deep-sea temperature of 50·5°, reached invariably at 400 fathoms ($731^{m}5$). As this temperature in the China sea is at the depth of 200 fathoms ($365^{m}8$), in the Celebes at 180 fathoms ($329^{m}2$), and in the Pacific at 230 fathoms ($420^{m}6$), it may be inferred that the Sulu sea is prevented from freely interchanging its waters with those seas by ridges which do not exceed those depths.

CURRENTS.—The general surface circulation, in the four quarters of the year, is shown in Figures 1 to 4. The rate given is the average rate, in miles per day, of all currents observed flowing within 45° on either side of the direction shown.

The west-going North Equatorial current, energised by the North-east trade wind, forms the southern part of the main clockwise current circulation of the North Pacific ocean. The North Equatorial current sets towards the Philippine islands, closely eastward of which it divides. The north-going branch passes the east coasts of Luzon and Formosa and becomes the Kuro shio, or Japan current, which forms the eastern side of the main circulation of the ocean. The southern branch sets southward along the east coast of Mindanao, and ultimately

GENERAL SURFACE CURRENT CIRCULATION

The average rate of current in miles per day is shown at the tail of the arrow to which it refers.

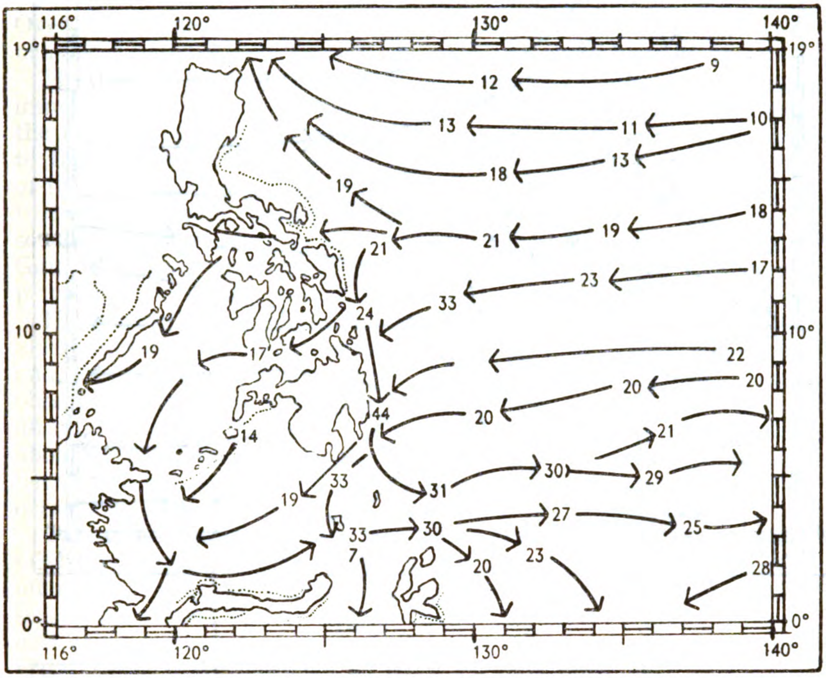


Figure 1.
December, January, February.

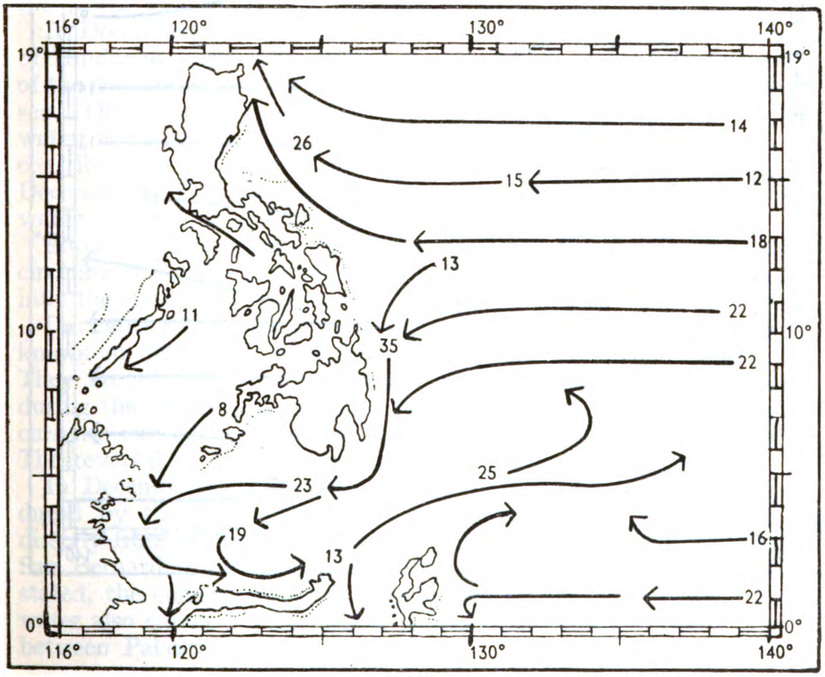


Figure 2.
March, April, May.

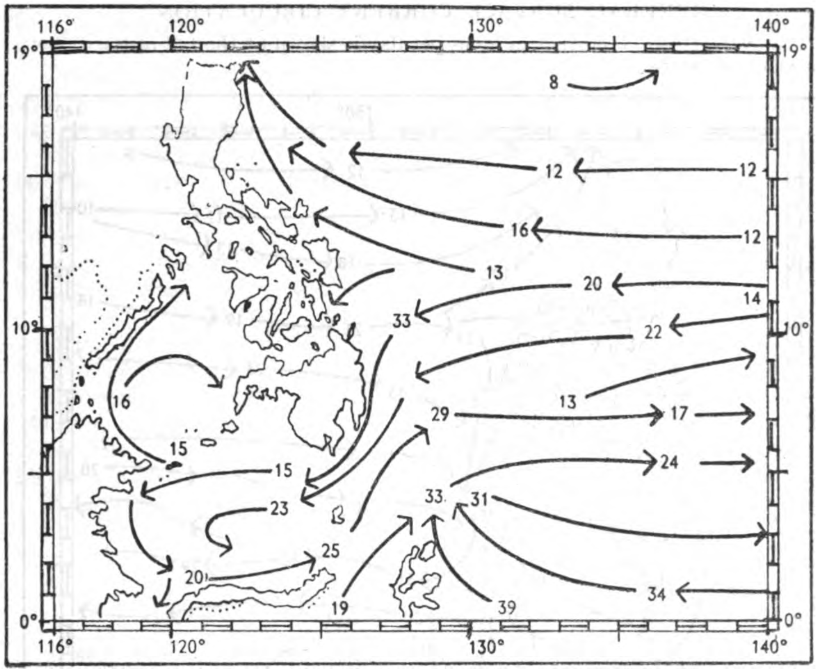


Figure 3.
June, July, August.

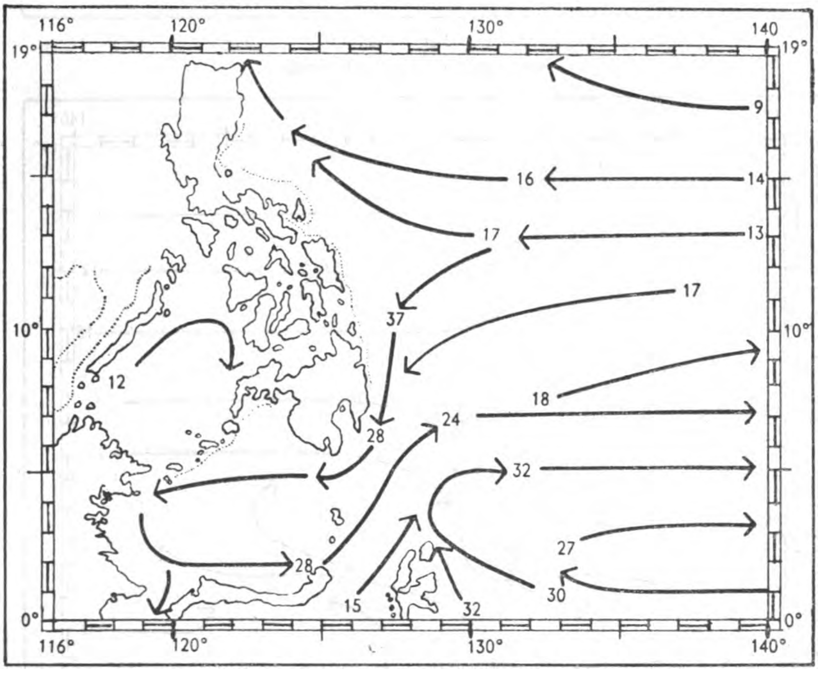


Figure 4.
September, October, November.

passes into the east-going Equatorial countercurrent of the North Pacific ocean. The northern edge of this countercurrent forms the southern limit of the North Equatorial current. This limit is not well-known and is probably subject to some seasonal shift in latitude. Over the greater part of the ocean, however, the countercurrent is usually found between lats. 4° N. or 5° N. and about 8° N.

The South Equatorial current sets westward across the ocean, immediately southward of the countercurrent. In March to November, the northern part of the South Equatorial current turns northward, to the eastward of Halmahera, and so contributes to the formation of the countercurrent. In December to February, however, it begins to turn southward, between longs. 140° E. and 150° E., and finally south-eastward, to flow in this direction along the north coast of New Guinea. During this quarter, therefore, the South Equatorial current plays no part in the formation of the countercurrent.

The southerly flow of the branch of the North Equatorial current along the east coast of Mindanao and past Cape San Augustin is strong and of a high degree of constancy. In June to February, the currents observed with a rate exceeding one knot form about 55 per cent. of all observations; in March to May, the corresponding percentage is about 35 per cent. A considerable number of currents with rates of between 2 and 3 knots have been recorded; in June to August an occasional current exceeds the rate of 3 knots. *See* page 632.

Currents of the Celebes sea.—The currents of this sea are also relatively strong. In March to November, the south-going current off the east coast of Mindanao sets south-westward into the Celebes sea. This results in a counterclockwise flow round the sea, with an east-going current along the north coast of Celebes. The emerging water turns north-eastward to form the beginning of the countercurrent in longs. 128° E. to 130° E. The circulation in the Celebes sea during these months is therefore a part of the main circulation of the North Pacific ocean.

In December to February, the bulk of the south-going current east of Mindanao turns south-eastward and directly forms the beginning of the countercurrent. Part of the water, however, enters the Celebes sea. Off the east coast of Borneo and north coast of Celebes the water flows round in a counterclockwise direction and emerges to contribute to the countercurrent, but the bulk of this circulation, in December to February, is derived from the Sulu sea, from which the water enters through the Sibutu and other passages.

Throughout the year, some water branches off from the Celebes sea circulation to flow south-westward into Macassar strait, and thence into the Java sea.

Currents of the Sulu sea.—The currents in this sea are not well-known in detail, the number of available observations being small. They are of monsoonal origin and are rather variable, particularly during the South-west monsoon period. The rate of the majority of currents experienced does not exceed one knot, throughout the year. The reversal of direction is shown in Figures 1–4.

In December to February, when the south-westerly currents produced by the North-east monsoon are most constant, water flows directly from the North Equatorial current into the Sulu sea through San Bernardino and Surigao straits. During this quarter, as above stated, the current from the Sulu sea enters the Celebes sea. Some water also enters the China sea, at this time, through Balabac strait, between Palawan and Borneo.

Observations are insufficient to give exact information about the set of current through Balabac strait, Mindoro strait and Verde Island passage. The currents are variable and often indefinite and depend upon the wind blowing at the time. The following predominant trends of current appear from the information available.

Verde Island passage.—West-going, November to May.
East-going, July to October.
Mindoro strait.—West-going, January to June.
East-going, July to November.
Balabac strait.—West-going, December to March.
East-going, September to November.

Tidal streams are superimposed on the currents in the strait, *see* page 108.

Chart 943.

TIDAL STREAMS.—Two tidal streams enter the Sulu sea and passages between the Philippine islands from opposite directions; one from the China sea through the western openings, the other from the Pacific through the eastern straits, viz., San Bernardino, Surigao and Basilan. These streams meet in the many channels between the southern islands.

The stream from the China sea passes from north to south along the western coasts of Luzon and Palawan, and through Verde Island passage, Mindoro strait, Linapacan and Balabac straits.

The Verde island stream, after passing southward along the coast of Luzon and deflecting some of its waters into Manila bay, continues along the coast southward and eastward as far as Punas point (*Lat. 13° 36′ N., Long. 121° 17′ E.*), where it branches. One stream runs north-eastward round Tayabas bay, and northward and eastward of Marinduque, through Mompog pass, reunites with the other branch which sets south-eastward along the Mindoro coast as far as Dumali point, and then eastward, southward of Marinduque as far as the Bondoc peninsula, where it meets the stream from the Pacific, which has passed through San Bernardino strait. The northern part of the Verde island stream, which follows round Balayan and Batangas bays, reunites with the principal stream near Verde island, producing violent tide-rips and eddies in that part of the channel between Malabrigo and Escarceo points.

In the Sibuyan sea, that part of the sea between Masbate island and Mindoro, the tidal streams are not strong, except off Arena point, the south-eastern extremity of Bondoc peninsula, where they acquire some force from the amount of water that enters and leaves Ragay gulf.

The stream that enters by Mindoro strait follows the coast of Mindoro, part of it continuing round the coast of that island northward of Dumali point, where it meets the stream through Verde Island passage. The rest of the stream sets south-eastward and divides at the north-western point of Panay, one branch flowing along the northern coast of Panay, past Bulacaue point and the Gigantes islands to Bulalaqui point, the northern extremity of Cebu, where it turns southward and meets the stream from the Pacific through Surigao strait, about 6 miles southward of the Camotes islands. It also flows into Iloilo strait and Tañon strait, in both of them meeting the stream which has entered from the southward, on the parallels of the northern end of Negros, and of Tajao (Tahao) point (*Lat. 10° 21′ N., Long. 123° 35′ E.*), Cebu, respectively.

The other branch, turning southward from the north-western point

Chart 943.

of Panay, and being joined midway by the stream setting eastward of Cuyo islands or Linapacan strait, continues coasting Panay and Guimaras islands into Iloilo strait, until it meets the other branch described above. Between the Calamian group and the northern end of Palawan the streams set south-eastward and north-westward.

The east-going stream entering by Balabac strait, turns north-north-eastward along the east coast of Palawan, and spreads itself like a fan over the Sulu sea in a north-easterly and easterly direction, forming the east-going stream between Cuyo islands and Panay, and also that which sets southward of the Cagayan islands, where it is reported to meet the stream from Surigao strait approximately on the meridian of Cagayan island.

In Sibutu passage the flood stream sets north-westward; and also in the Sulu archipelago the flood stream sets generally northward and westward, but takes many local directions among the islands, where it also appears to be influenced by the monsoon currents. In the channels between the islands of the Sulu archipelago the tidal streams are strong and irregular, and overrun the times of high and low water by from 2 to 3 hours.

Through Basilan strait the west-going stream passes up the west coast of Mindanao northward until it meets the south-going stream from Surigao strait somewhere midway off the coast.

SIGNALS.—Storm signals.—The following system of storm signals is in use in the Philippines. The signals are shown in accordance with advices received from the Weather Bureau.

DAY SIGNALS.

Signal	*Symbol*	*Meaning.*
1	T	(*a*) Indications of a distant typhoon, the direction of movement of which is still unknown. The signal will be changed in case the typhoon becomes more threatening. (*b*) Typhoon, the direction or distance of which is at present such, that it may pass off without seriously affecting the archipelago. (*c*) Depression of little importance, though it may develop later into a typhoon.
2	—	Centre of typhoon will pass or is passing northward at a considerable distance. Strong winds from the SW. quadrant (west to south), which may acquire considerable force and continue for several days.
3	⊥	Centre of typhoon will pass or is passing southward at a considerable distance. Strong winds from the east quadrant (north-east to south-east), which may acquire considerable force.
4	◆	Typhoon dangerous, though the danger is not yet imminent. Look out for the next signal.
5	▲	Gale expected from the NW. (north to west).

DAY SIGNALS—*continued.*

Signal	*Symbol*	*Meaning.*
6	▼	Gale expected from the SW. (south to west). Centre of typhoon will pass or is passing northward at a short distance. Strong gales from the NW., and especially from the SW. quadrants, which may reach hurricane force. In rare cases of typhoons coming from the China sea and moving north-eastward, the wind will veer from SE., through south, to NW.
7	▲ ▲	Gale expected from the NE. (north to east).
8	▼ ▼	Gale expected from the SE. (south to east). Centre of typhoon will pass, or is passing, southward at a short distance. Strong gales from the NE., and especially from the SE. quadrants, which may reach hurricane force. In rare cases of typhoons coming from the China sea and moving north-eastward, the wind will back from SE., through east, to north.
10	+	Centre of typhoon will pass, or is passing, over or very near the place.

Note.—No. 9 signal is used in Hong Kong only.

NIGHT SIGNALS.

Signal.	*Lights, vertically disposed.*
1	White, white, white
2	White, green, white
3	Green, white, green
4	White, white, red
5	White, green, green
6	Green, white, white
7	Green, green, white
8	White, white, green
10	Red, green, red

On any one of the above-mentioned signals being made, mariners should take every possible precaution to ensure the safety of their vessels.

Harbour signals.—*Philippine islands.*—The following signals or calls shall be used and recognised at Philippine ports of entry :—

Customs.—International Code signal E.H.C. ; at night, three or four short blasts of the whistle and waving of a light.

Quarantine.—International Code flag Q at fore.

Pilot.—As laid down in the International Code of Signals.

Explosives or inflammables.—International Code flag B at fore.

Medical assistance.—International Code flag Q.

Infectious or contagious disease.—International Code signal E.Z.Q.

Death.—International Code signal E.N.L. Customs or quarantine calls.

Distress.—As laid down in the International Code of Signals.

Water boat.—International Code signal R.C.Q. or F.U.

Harbour police.—Customs' call.

At ports of entry included in this volume, signals will be answered from the Custom house or Pilots' signal tower.

Special signals for surveying vessels of the United States employed in hydrographic surveying.—A surveying vessel of the United States under way and employed in hydrographic survey, may carry in a vertical line not less than 6 feet ($1^{m}8$) apart where they can best be seen, three shapes not less than 2 feet ($0^{m}6$) in diameter, of which the highest and lowest shall be globular in shape and green in colour, and the middle one diamond in shape and white.

At night a surveying vessel under way shall carry the regular lights prescribed by the Regulations for Preventing Collisions at Sea.

A surveying vessel when at anchor in a fairway on surveying operations, shall display from the mast during the day two black balls, vertically disposed, 6 feet ($1^{m}8$) apart. At night two *red* lights shall be displayed in the same manner. In the case of a small vessel the distance between the balls and between the lights may be reduced to 3 feet ($0^{m}9$) if necessary.

Such vessels, when at anchor in a fairway on surveying operations, shall have at hand and show, if necessary, in order to attract attention, a flare-up light in addition to the lights which are, by this regulation, required to be carried.

Signal to be made by vessels when inconvenienced by searchlights.—In the event of the navigation of a vessel being inconvenienced by the glare from searchlights near a port in the British Empire, she should make the International code signal ZO (— — • • — — —) by lamp and by whistle, siren or fog horn.

Both the light and sound signals should be employed, whenever possible, and should be repeated until the inconvenience is removed.

Only real urgency should necessitate the use of this signal, as unless the vessel is actually in the rays of a searchlight, it is not possible for the operators to know which projector is affected.

This signal is designed to assist mariners ; no liability whatever will be admitted.

This signal should also be used in similar circumstances near ports in other countries.

SUBMARINE CABLES.—The following articles are taken from the International Convention for the Protection of Submarine Telegraph Cables, of 14th March, 1884 :—

II. It is a punishable offence to break or injure a submarine cable, wilfully or by culpable negligence, in such manner as might interrupt or obstruct telegraphic communication, either wholly or partially, such punishment being without prejudice to any civil action for damages.

This provision does not apply to cases where those who break or injure a cable do so with the lawful object of saving their lives or their ship, after they have taken every necessary precaution to avoid so breaking or injuring the cable.

V. Vessels engaged in laying or repairing submarine cables shall conform to the regulations as to signals which have been, or may be, adopted by mutual agreement among the High Contracting Parties, with the view of preventing collisions at sea.

When a ship engaged in repairing a cable exhibits the said signals, other vessels which see them, or are able to see them, shall withdraw to or keep beyond a distance of one nautical mile at least from the ship in question, so as not to interfere with her operations.

Fishing gear and nets shall be kept at the same distance.

Nevertheless, fishing vessels which see, or are able to see, a telegraph-ship exhibiting the said signals, shall be allowed a period of twenty-four hours at most within which to obey the notice so given, during which time they shall not be interfered with in any way.

The operations of the telegraph-ships shall be completed as quickly as possible.

VI. Vessels which see, or are able to see, the buoys showing the position of a cable when the latter is being laid, is out of order, or is broken, shall keep beyond a distance of one-quarter of a nautical mile at least from the said buoys.

Fishing nets and gear shall be kept at the same distance.

VII. Owners of ships or vessels who can prove that they have sacrificed an anchor, a net, or other fishing gear in order to avoid injuring a submarine cable, shall receive compensation from the owner of the cable.

In order to establish a claim to such compensation, a statement, supported by the evidence of the crew, should, whenever possible, be drawn up immediately after the occurrence ; and the master must, within twenty-four hours after his return to or next putting into port, make a declaration to the proper authorities.

The latter shall communicate the information to the Consular authorities of the country to which the owner of the cable belongs.

Caution.—Cautionary notes appear on many charts, calling attention to areas in which there are telegraph cables ; these areas are indicated by pecked lines on the charts.

Every care should be taken to avoid anchoring in such areas, even though there may be no specific prohibition against doing so, in view of the serious interference with communications which results from damage to submarine cables. Equal care should be taken wherever the symbol for a submarine cable (a wavy line) is shown on the chart.

Danger involved in cutting a submarine cable to clear anchors or fishing gear.—In the event of any vessel fouling a submarine cable, every effort should be made to clear the anchor or gear by normal methods ; should these efforts fail, the anchor or gear should be slipped and abandoned *without attempting to cut the cable. High voltages are, or may be, fed into certain submarine cables ; serious risk exists of loss of life due to electric shock, or at least of severe burns if any attempt to cut the cable is made.* No claim in respect to injury or damage sustained through such interference with a submarine cable will be entertained.

Compensation for anchors or fishing gear sacrificed in order to avoid injuring a submarine cable can be claimed under the Submarine Telegraph Act of 1885 (Schedule of Submarine Telegraph Convention, Article VII).

RADIO STATIONS.—The following are the coastal radio stations in the area covered by this volume, which are open for public correspondence :—

In the Philippines :—San Jose, Coron, Culion, Cagayan Sulu (Cagayan de Sulu in list), Puerto Princesa, Bongao, Jolo, Zamboanga, Malabang, Lebak, Malita, Davao, Batangas, Iloilo, Cajidiocan, Lucena, San Pascual, Catbalogan, Cebu, Mambajao, Aparri, Baler, Casiguran, Infanta, Legaspi, Tacloban, Baganga, and Mati.

In the State of North Borneo :—Kudat, Sandakan, and Tawau.

For details *see* List published by the General Secretariat of the International Telecommunication Union.

For details of radio telegraph stations which transmit weather bulletins, storm signals, navigational warnings, time signals, etc., *see* Admirality List of Radio Signals.

AIR LIGHTS.—Mariners are warned that lights (with definite characteristics), which are not ordinary navigational aids, may be exhibited for the use of aircraft from structures near the coasts described in this volume.

These lights are often of great luminous power and altitude and may be the first lights or looms of lights sighted when making a landfall at night; they normally have the following characteristics:—

(*a*) *Flashing white* (revolving beam type).
(These lights are usually screened from seaward but their looms may be visible.)
or (*b*) *Alternating flashing white and green* (revolving beam type).
or (*c*) *Flashing two letter groups* in the Morse Code, in *red* or *green*.
(Although the groups made by these lights may have definite meanings in the International Code of Signals, their signification is to be disregarded; the fact that they are *red* or *green* in colour, and flash with mechanical regularity, should prevent their being mistaken for signals from shore signal stations or ships.)

Air lights which appear likely to be visible from seaward will be shown on charts and described in the Admiralty List of Lights. As they are subject to changes of which prompt notification to the mariner may not always be possible, care should be taken that they are not confused with marine navigational aids.

REPAIRS.—There is no docking accommodation at any of the ports included in this volume. There are patent slips at Sandakan, Iloilo, and Port Cebu, details of which are given in Appendix I.

COAL AND FUEL OIL.—Coal and fuel oil can be obtained at Iloilo and Port Cebu.

STANDARD TIME.—All information regarding Standard times and summer times will be found in the Admiralty List of Radio Signals, Vol. II.

PASSAGES.—For passages to and from the Philippine islands, *see* the Admiralty publication "Ocean passages for the world."

Caution.—The southern part of the Sulu sea and the Sulu archipelago are as yet incompletely surveyed, and these waters should therefore be navigated with caution. Generally speaking, navigation in all the waters described in this volume requires caution, on account of irregular and uncertain currents and of the prevalence of coral formations, which may have escaped detection, even in recent detailed surveys, and of which the soundings very often give no warning.

In navigating the waters of the Philippines during the rainy season a sharp look-out must be kept for flotsam. Trees of immense size will be frequently met afloat. They have been found especially numerous off the south-coast of Luzon; in one case, near Marinduque, a group of them was adrift, still upright, and resembling an island.

Charts 967, 2576.

Balabac strait to Sandakan and Sibutu passage.—After passing through one of the channels of this strait, directions for which are given in Chapter IV, and for Main channel on page 114, the shoals extending to about 30 miles eastward of Banguey island must be

Charts 967, 2576.
rounded and a course set to make Muligi islands on a south-easterly bearing.

From off these islands a course southward towards Sandakan can be set, or south-eastward for one of the passages between the banks off the north-eastern point of Borneo and thence to Sibutu passage.

Charts 967, 943.

Balabac strait to the north-eastward.—The usual route is through the Nasubata channel, thence across the Sulu sea as direct as possible, passing south-eastward of Tubbataha reefs, thence, if bound to Iloilo, passing south-eastward of the Cavili and Cagayan islands and thence direct to the southern approach to Iloilo (page 336); or, if bound to Cebu, direct to the southern end of Negros and along the east coast of Cebu to the southern approach to Port Cebu (page 461). This latter is the direct route to San Bernardino strait, and after passing eastward of the northern end of Cebu, the usual route is eastward of the southern end of Masbate, eastward of Tagapula (page 421) and between Dalupiri and Samar (page 423).

Charts 3806, 3807, 3808.

Manila to San Bernardino strait.—The usual route is by Verde Island passage (page 309), thence southward of the Tres Reyes islands, south-westward of Marinduque, thence between Burias to the northward and Masbate and Ticao to the southward, thence round the south-eastern end of Luzon.

Charts 3806, 3807, 3809.

Manila to Iloilo.—Through Verde Island passage to Dumali point (page 320), thence southward of Simara island, thence between Romblon and Tablas islands, thence south-westward of Jintotolo island, thence through one of the channels north-eastward of the north-eastern end of Panay, and thence between Panay and Negros (page 368).

Another route is, after passing Dumali point, to proceed between Mindoro and Tablas island, thence between the north-western end of Panay and Maniguin island, thence round the southern end of Panay into the southern approach to Iloilo (page 336).

Charts 3806, 3807, 3809, 3811.

Manila to Zamboanga.—The usual route is the same as that last described as far as the southern end of Panay, thence as direct as the circumstances of navigation permit across the eastern part of the Sulu sea to Basilan strait (page 237).

Charts 3806, 3807, 3808, 3809.

Manila to Cebu.—The direct route is from Verde island passage to Jintotolo island, as given above for passage to Iloilo, thence northward of Gigantes island, thence northward of Tanguingui island, thence between Chocolate and Malapascua islands, thence between Capitancillo island and the east coast of Cebu, thence along the east coast of Cebu to the northern entrance of Port Cebu (page 459).

An alternative route, somewhat longer, is to pass northward of Masbate and Ticao, as given for the route to San Bernardino strait, thence along the east coasts of Ticao and Masbate, thence eastward of Malapascua island, and thence southward as directed in the preceding paragraph; or, instead of passing northward of Ticao, the route via Black Rock pass (page 396), between the southern end of Ticao and Masbate, may be taken.

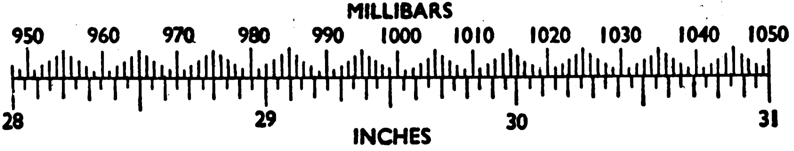
CLIMATE AND WEATHER. — General remarks. — Articles 1, 2, 3 and 4 in the General Meteorology Section of the preliminary pages are appropriate to this Pilot.

The general seasonal characteristics of the weather in the area covered by this Pilot are illustrated by the climatic tables given on pages 29-37.

The climate of this region is hot and damp, with considerable rainfall. The North-east monsoon prevails from October to April in the north of the area and from November or December to April in the south, and reaches Beaufort force 7 or more on about seven days per month from November to January north of about lat. 15° N. The South-west monsoon is predominant from late June until the end of September. On an average about four severe typhoons affect the region in a year, occurring most often in September and October, but very rarely between January and April. They are the greatest meteorological danger to navigation in these waters, since coastal fog is very uncommon, and fog at sea is almost unknown.

Pressure.—In the southern part of the region covered by this Pilot mean pressure is about 1009 mb. throughout the year, but in the northern part there is a seasonal variation in sympathy with the large variation from winter to summer over Asia, mean pressure being about 1014 mb. from December to March and about 1006 mb. in July and August. In addition to irregular fluctuations due to variations in the intensity and position of the winter anticyclone over Asia, and to typhoons passing across or near to the Philippines, principally in summer and autumn, there is a regular diurnal variation with maxima at about 0900 and 2200 or 2300, and minima at about 0300 or 0400 and 1500 or 1600, local time, the range of this variation being about 3 mb. If the barometer reading is as much as 3mb. below the normal for the time of day, and for the month in question, this should be regarded as a warning that a typhoon may be forming, or approaching the ship (*see* standard article on tropical revolving storms, page xxxvi).

The following diagram shows the equivalent of millibars in inches and vice-versa :



Wind.—*North-east monsoon.*—In winter, while mean pressure is high over Asia, the north-easterly winds of the North-east monsoon prevail in this region (*see* Figure 1, Pressure and predominant winds in January, page 18). North of lat. 10° N. they are well established by October, and continue until April, but in that month are rather less steady in direction, winds from east and south-east becoming almost as common. Further south this monsoon is sometimes established by November, but often not until December, while in April, although winds from between north and east are still the most common, winds from other directions become increasingly frequent.

The arrows show the direction of the predominant wind if its constancy is at least 51 per cent. according to the following scheme :—

⇢ 51–60% → 61–80% ⇒ 81–100%

Predominance is judged in relation to that quadrant (90°), not necessarily bounded by the four cardinal points, which shows the greatest number of winds. Only winds of force 3 or more are taken into account in estimating predominance. The arrow shows the direction bisecting the quadrant, and the constancy is defined as the percentage relation between the number of winds from that quadrant, of forces 3–12, and the total number of winds observed from all directions (including forces 0–2).

During the North-east monsoon, the wind 20 miles or more from the coast, blows with great persistence from a north-easterly direction, over 70 per cent. of all winds being from between north and east (*see* Figure 1, Pressure and predominant winds in January). Its strength varies considerably with the prevailing synoptic situation, but, in general, it is much stronger in the north of the region than in the south; north of about lat. 10° N. it blows with Beaufort force

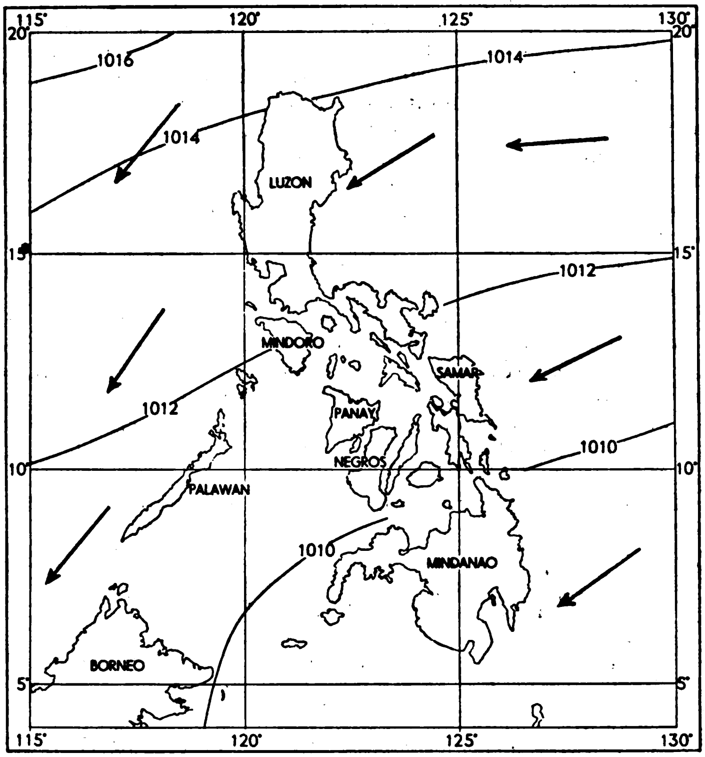


Figure 1.

Mean pressure and predominant winds in January.

5 or more on 6 to 10 days per month, and, off the east coast of Luzon it attains force 7 or more on about 7 days per month from November to January. Between about lats. 10° N. and 15° N. this strength is only reached on about one day per month, and very rarely further south (*see* Figure 3, Gale frequency in January, page. 19)

An increase of pressure is generally followed by an increase in the strength of this monsoon.

Near the coast the wind is much more variable, especially where the land is mountainous, as is the case on most of the islands (*see* Local modification of the weather near the coast, page xlvi). Land and sea breezes are fairly well developed on coasts sheltered from between north and east, and may deviate, reinforce, annul or even reverse the monsoon wind. During periods, when the monsoon is weak they may blow even on the more exposed coasts.

There are also many local variations of the coastal winds, and of the prevailing direction of the monsoon, due to the mountains and numerous islands; where these give enough shelter the monsoon may be replaced for several days in succession by variable winds. On the other hand the monsoon is often intensified in channels such as those between Panay, Guimaras and Negros, and between Negros and Mindanao, and sometimes reaches gale force.

In regions where the mountains are near the coast the land breeze is sometimes very squally. This has been noted for instance on the west coast of Mindoro, especially in Paluan bay, and on the south coast of Luzon.

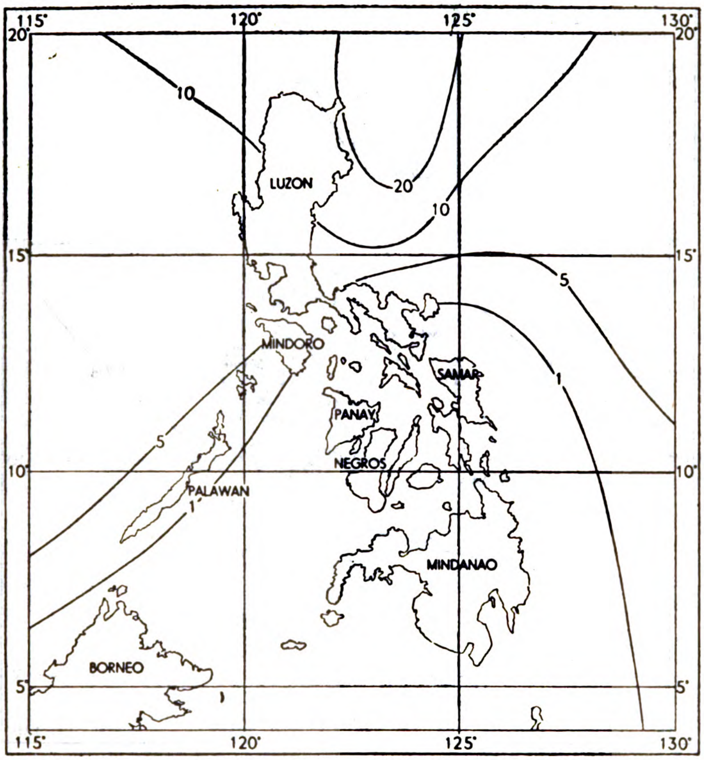


Figure 3.

Gale frequency in January.

South-west monsoon.—In summer, while mean pressure is low over Asia, the south-westerly winds of the South-west monsoon become increasingly frequent. (*See* Figure 2, Pressure and predominant winds in July, page 20.) This monsoon is best developed from July to September, but is much less steady in direction than the North-east monsoon, winds from east, south-east and north-west being fairly common.

Twenty miles or more from the coast, from July to September, the wind blows with force 5 or 6 on one or two days per month generally, but on about four days per month eastward of Mindanao. Gales blow on less than one day per month on an average. They are least likely in May. Gales or strong winds from west or south-west, known as " collas ", occur sometimes; they are usually accompanied by heavy rain, and are probably associated with a typhoon centred further north, or with one which has not fully developed. (*See* Figure 4, Gale frequency in May, page 21.)

Near the coast, as is the case during the North-east monsoon, winds are much more variable, and for the same reasons. Land and sea breezes are even more prominent owing to the fact that the South-west monsoon is weaker and less steady in direction.

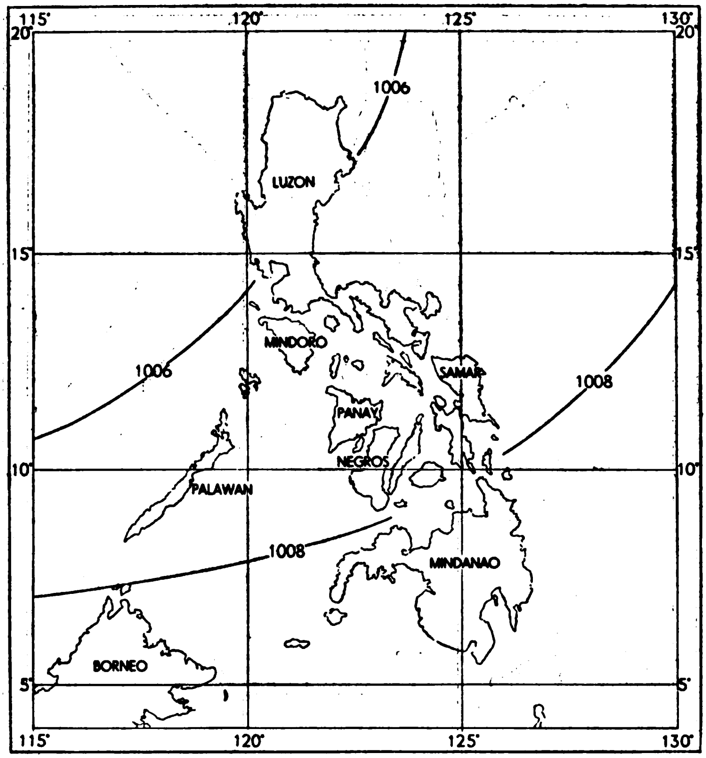


Figure 2.
Mean pressure and predominant winds in July.

In regions where the mountains are near the coast the land breeze is sometimes very squally. This has been noted especially on the north coast of Mindanao. Squalls associated with thunderstorms are rather frequent during this monsoon, and also in May and June before it is well established; they sometimes reach gale force.

Typhoons.—The name " typhoon " is given to the tropical revolving storms of the western part of the North Pacific ocean and the China sea. They are sometimes called " Baguios " in the Philippines, but the name is not used in official weather messages, or in warnings to shipping. They are similar to the tropical revolving storms of other parts of the world (*see* standard articles, page xxxvi), and are the outstanding meteorological danger to shipping in these waters. Winds of considerably more than 100 knots have occurred in severe typhoons, and it is probable that in the open sea speeds approaching 150 knots may sometimes occur.

According to J. Coronas, the number of typhoons which crossed the Philippines or approached near enough to affect the weather on the 5 islands in each month of the 11 years 1908–18 was :

Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
4	1	3	4	10	11	27	28	43	21	25	13	190

According to the same writer the number of severe typhoons which traversed or touched the Philippines in the 16 years 1903–18 was as follows :—

Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1	–	–	1	3	4	6	9	13	13	6	4	60

This represents an annual average of nearly 4 severe typhoons, but the number varies much from year to year, e.g. in each of the years 10 1908 and 1911 there were 7, and in 1916 only 1. The great majority of the typhoons that cross the Philippines follow a track from about east-south-east to west-north-west, and either strike the mainland of China or turn northward and eventually north-eastward across or near to Japan ; some turn northward before reaching the islands, 15 especially from January to April. Those which cross the Philippines

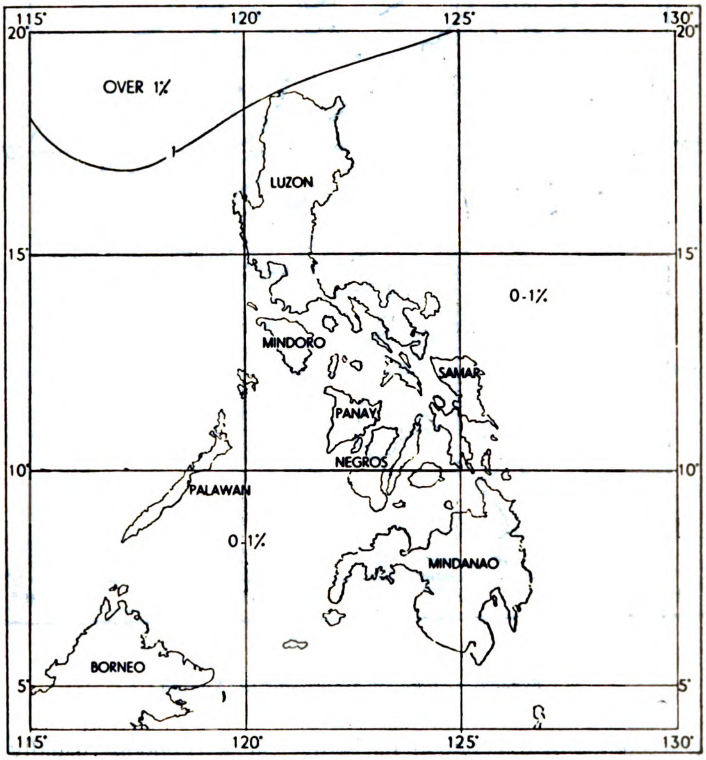


Figure 4.

Gale frequency in May.

do so on an average in about lat. 10° N. from December to March, the mean latitude increasing steadily in subsequent months to a maximum during the latter part of August, when it is unusual for a track to lie south of lat. 18° N. Subsequently the mean latitude decreases again to its winter minimum.

In Figures 5 and 6 some typical typhoon tracks are shown for the months of August and December, respectively.

Typhoon harbours.—In the area covered by this volume, the following harbours offer excellent shelter during typhoons. They are the more important harbours of refuge, but numerous other harbours offer shelter, and masters of vessels should use discretion in their choice of a typhoon harbour. Since typhoons usually give ample warning of their approach, together with their probable path, anchorage should be chosen which offers best shelter from the winds which will prevail during the coming typhoon. If in the vicinity of any of the following harbours, they should be given preference :—

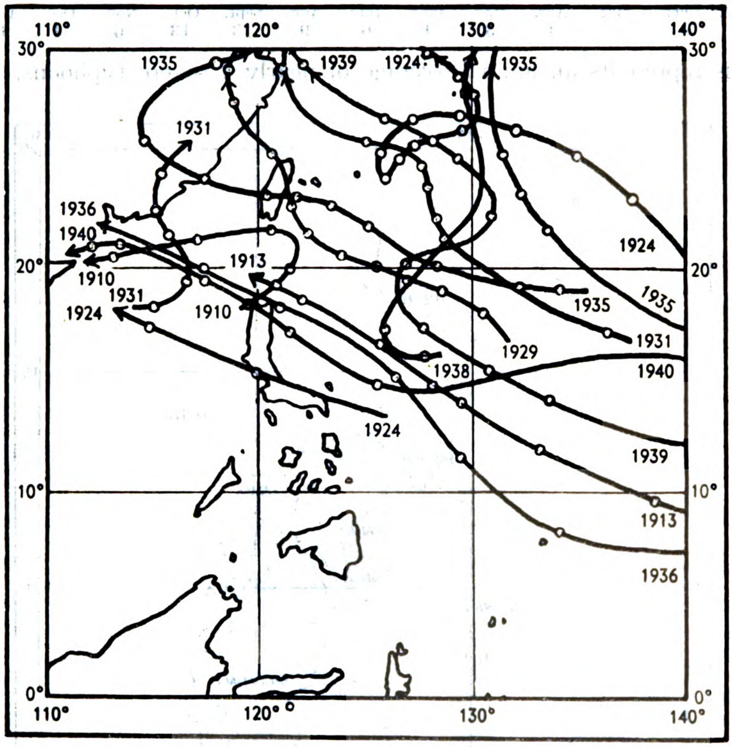


Figure 5.

Typical tracks of typhoons in August.

East coast of Palawan and adjacent islands : Coron, Halsey harbour, Cuyo, Puerto Princesa, Port Ciego, and Balabac.

Sulu archipelago : Port Bongao, Dalrymple harbour.

Mindanao and adjacent islands : Port Isabella, Port Masinloc, Port Banga, Port Sibulan, Dumanquilas bay, Polloc harbour, Port Lebak, Malalag bay, Misamis, Nasipit, Port Sibonga, Catarman anchorage, and Port Balete.

Lubang island: Port Tilig.
Mindoro island: Soguicay bay, Port Galera.
Tablas island: Looc bay.
Panay island: Iloilo harbour.
Romblon island: Romblon harbour.
Marinduque island: Santa Cruz harbour, Port Balanacan.
Burias island: Port Busin.
South coast of Luzon: Sorsogon bay.
Ticao island: Port San Miguel.
Cebu island: Port Cebu.
North coast of Luzon: Port San Vicente.

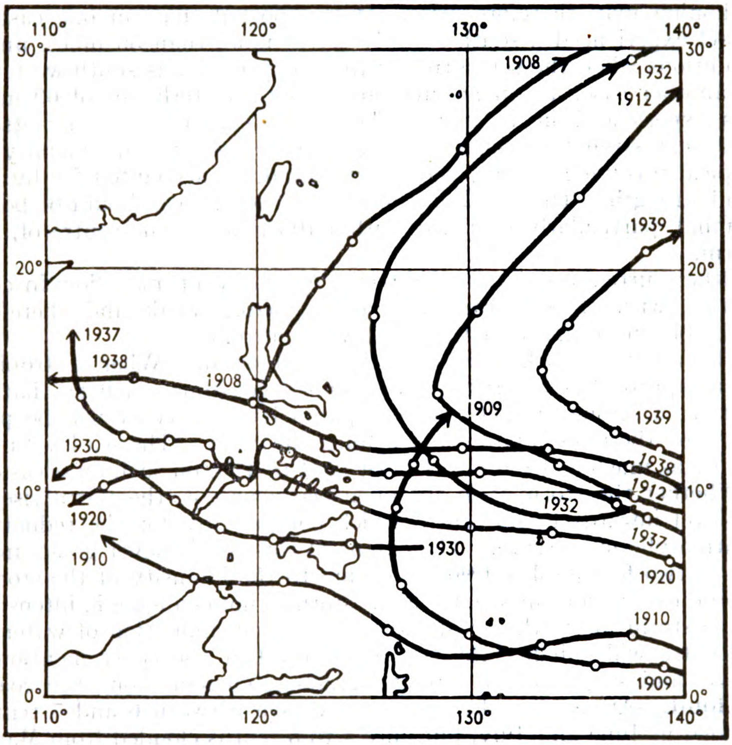


Figure 6.

Typical tracks of typhoons in December.

East coast of Luzon: Port Bicobian, Diapitan bay, Casiguran bay, Hook bay (Polillo island), Dahikan bay, Lamit bay and Coal harbour.

Samar island: Port Aguirre (Canahauan islands), Helm harbour, and Pambujan harbour (Matarinao bay).

Effect of tropical revolving storm on the current.—In the vicinity of a tropical revolving storm, the set and drift of current may be markedly different from that normally to be expected. Comparatively little is known about such currents, particularly near the centre of the storm, since navigators avoid the centre whenever possible and conditions within the storm field generally are unfavourable to the accurate observation of current.

The primary cause of the currents is the strong wind associated with the storm. The strength of current produced by a given force of wind varies with latitude and is greatest in low latitudes. For the latitudes of tropical storms, say 15° to 25°, a wind of force 10 would produce a current of about one knot. It is believed that the strength of the currents of tropical storms is, on the average, the same as that which wind of similar force, unconnected with a tropical revolving storm, would produce. These currents, at the surface of the water, set at 45° to the right of the wind direction (in the northern hemisphere) and therefore flow obliquely outward from the storm field, though not radially from the centre.

Unless due allowance is made for these sets, very serious errors in reckoning may therefore arise. It is reported that, in one case, a vessel experienced a south-easterly set of more than 50 miles, under conditions when the set normally to be expected was south-westerly. In another case, an unexpected south-south-westerly set of 60 miles was experienced in 18 hours. These are examples of currents of abnormal strength, which are occasionally met in the vicinity of tropical revolving storms, and which cannot be accounted for by the wind strength. The possibility of such an experience should be borne in mind, particularly near, say within 100 miles of the centre of, the storm.

Other currents, not caused directly by the wind, may flow in connection with these storms but are probably weak and therefore negligible in comparison with the wind current.

The above remarks apply to the open ocean. When a tropical storm approaches or crosses an extended coastline, such as that of Florida, a strong gradient current parallel to the coast will be produced by the piling up of water against the coast. The sea-level may rise by as much as from 8 to 15 feet (2^m4 to 4^m6) on such an occasion.

Whether the storm is in the open ocean or not, there is a rise of sea-level inwards to its centre which compensates for the reduction of atmospheric pressure. The extent of this rise is never great, from one to two feet (0^m3 to 0^m6) according to the intensity of the storm. It produces no current so long as the storm is not changing in intensity. If the storm meets the coast, however, the accumulation of water at its centre will enhance the rise of sea-level at the coast mentioned above, and so produce a stronger gradient current along the coast.

Cloud.—At sea the sky is on an average between 6 and 7 tenths clouded in June and July, but only 4 to 5 tenths clouded from March to April. On the coast the amount is much affected by the degree of sheltering from the monsoons. Exposure to the North-east monsoon in some places makes winter the cloudiest season, but as a rule June to August is the cloudiest time, with an average of 7 to 8 tenths, and March to April the least cloudy, with 4 to 6 tenths. On the island of Cuyo (*Lat. 10° 51′ N., Long. 121° 01′ E.*) mean cloudiness is as high as 7 tenths even in March and April, and is about 9 tenths from June to September.

Rain.—Rainfall is generally large, ranging from nearly 50 inches to 150 inches or more (from twice to more than six times that of the south-eastern part of England). As a rule coasts exposed to the North-east monsoon and sheltered by mountains from the SW. monsoon have most of their rainfall in winter, for example at Suragao 103 inches falls between November and March but only 32 inches between May and September. On the other hand, on coasts exposed to the South-west monsoon and sheltered from the North-east monsoon summer and autumn are the wettest seasons, for example, Iloilo gets 68 inches between June and October, but only about 12 inches between December and April.

In the wettest months at the wettest places the average number of days per month with appreciable rain (0·04 inches or more) is between 20 and 25 and the number with considerable rain (0·40 inches or more) about 15. On Cuyo, where the average monthly rainfall from January to April is less than half an inch, the number of days of appreciable rain per month in those months averages only about one, while days of considerable rain hardly ever occur.

Much of the rain that falls between April and September is associated with thunderstorms, but such storms are uncommon when the North-east monsoon is well established. On land they occur most often in the late afternoon, and at sea in the early morning.

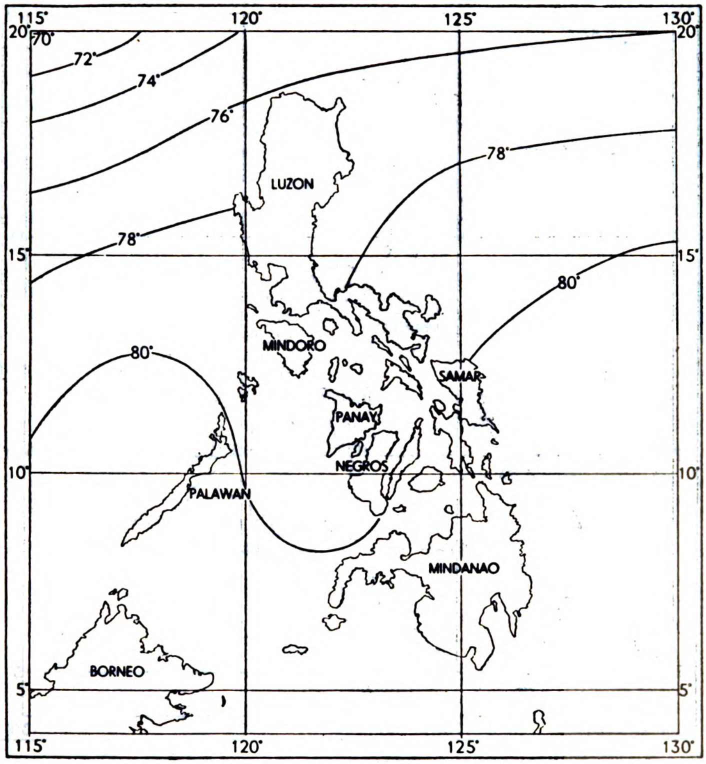


Figure 7.

Mean sea surface temperatures in January.

Fog and visibility.—At sea, fog is practically unknown, but occasionally, during exceptional downpours of rain, visibility may be reduced by the rain to less than half a mile, though generally only for a few minutes at a time. Visibility of less than 5 miles occurs on an average on two or three days per month in both monsoons on account of mist or haze. On the coast, particularly in the narrower channels and inlets, fog sometimes develops during the latter part of the night when there is little or no wind or cloud, but such fogs are rare and quickly disperse after sunrise.

Temperature and Humidity.—In the south, monthly mean temperature is about 80° from October to March and between 80° and 84° from April to September. Farther north the seasonal variation is greater, the mean at Aparri, on the north coast of Luzon, being 74° in January and 84° in May and June. At Aparri temperature has been known to reach 100° in April, May and June and to fall to about 60° at night in November, December and January, but in most places the range is considerably less. The mean temperature of the surface of the sea in January ranges from about 76° in the north to 81° in the south, and in May is about 84° over the region generally. On individual days the sea temperature is on rare occasions 3° or 4° above or below the average for the month; this happens rather more often in the north than in the south.

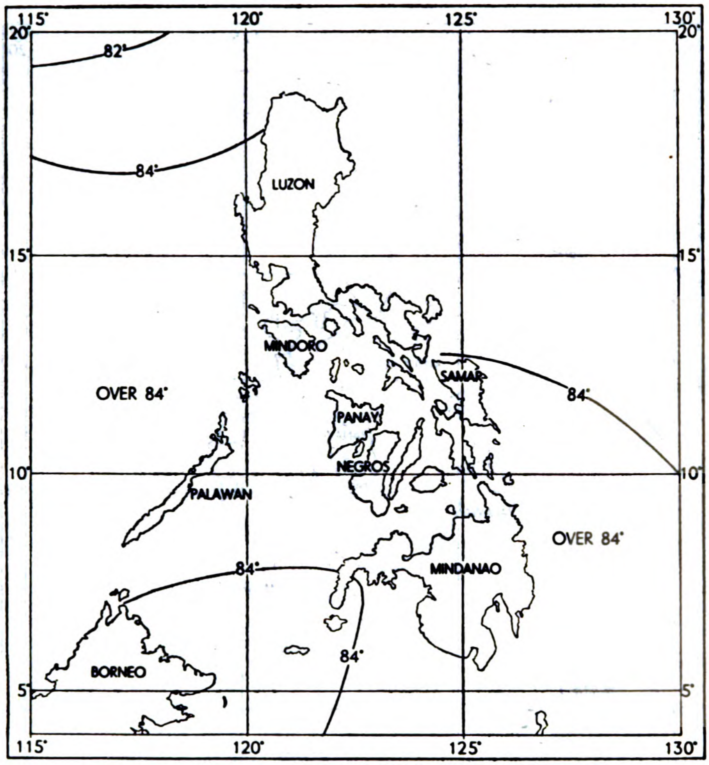


Figure 8.
Mean sea surface temperatures in May.

Mean relative humidity is in general rather high, being as a rule between 80 and 85 per cent, in all seasons. Since the daily range of temperature is not generally large, there is not the great fall of humidity during the afternoon that occurs in so many parts of the world.

Sea surface temperatures.—For the mean sea surface temperatures in January and May, *see* Figures 7 and 8, respectively, on page 25 and this page.

Climatic tables.—The tables that follow give statistics for several land stations at which there is a regularly reporting weather station. The figures given are averages, percentage frequencies, or extremes, as stated; it must be realised that these values refer to the actual positions in which the weather has been observed and *not* necessarily to the open sea or to the approaches to ports in the vicinity. The tables for land stations should therefore be consulted with discretion, since most meteorological elements are affected, sometimes a great deal, by local conditions. The following notes indicate ways in which conditions in the open sea may be different from those at the nearest reporting station for which a table is published.

(1) Temperatures over the sea are less extreme, or show smaller departures from the mean, than those over the land. In winter the air temperature over the sea is usually higher than that at a land station, especially during the night and early part of the day. In summer the air temperature over the sea is usually lower than that at a land station, especially during the afternoon.

(2) Since rainfall at coastal stations in this region is often largely orographic, the figures given are not representative of rainfall at sea in the vicinity. In general, rainfall is smaller at sea than on the coast, especially in those months when the monsoon is blowing onshore and the coast is backed by hills or mountains.

(3) Cloud amount, which in this region is very variable, is only broadly representative of the state of the sky at sea. There is a tendency for the amount to be less at sea than on the coast during the day, but to be slightly greater at night.

(4) Wind speed is nearly always greater over the sea than over the land, and there may be twice the number of gales at sea than are experienced at a shore station unless it is exceptionally well-exposed on, for example, a headland or small low-lying island. Wind direction is affected as explained under "Local Weather", on page 17.

(5) The figures for fog or poor visibility at inland stations or sheltered harbours are no guide to conditions at sea and in the approaches to ports (*see* under "Fog", page 25). On the rather rare occasions when there is fog on the coast, better visibility will nearly always be found at sea.

PLACE—CUYO. LAT. 10° 51′ N., LONG. 121° 01′ E. Height above Mean Sea Level, 14 feet (4m3).

Climatic Table compiled from 10 to 35 Years' Observations to 1937.

MONTH	PRESSURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION																		Mean wind force		No. of days with gale	No. of days with fog or mist
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	0600	1400	Clear (less than 2/10)	Cloudy (more than 8/10)	Average fall	No. of days with 0·04 in. or more	0600									1400									0600	1400		
												Percentage of observations from									Percentage of observations from												
												N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm				
	mb.	° F.	° F.	° F.	° F.	%	%			in.																				Beaufort			
January	1010	85	76	88	73	87	76	0	8	0·7	1	28	62	0	0	0	0	0	0	10	42	54	0	1	0	1	0	2	0	2·7	3·1	—	—
February	1010	86	76	89	73	88	73	0	6	0·4	0·4	31	51	0	0	0	0	0	1	17	49	43	0	0	0	1	1	6	0	2·3	2·9	—	—
March	1010	88	77	91	74	88	71	0·2	4	0·3	0·7	25	52	0	0	0	0	0	1	22	45	45	0	0	1	0	3	6	0	2·2	2·9	—	—
April	1009	91	78	94	75	87	69	0·8	4	0·8	2	20	42	0	0	1	0	1	2	34	50	28	0	0	1	4	6	10	1	1·6	2·7	—	—
May	1008	90	78	94	74	89	72	0	14	7·9	13	8	10	0	1	6	8	5	1	61	23	7	0	2	15	22	17	7	7	1·0	2·4	—	—
June	1008	88	76	91	73	91	75	0	18	12·5	18	1	3	1	1	12	15	8	1	58	5	1	1	2	22	36	18	5	10	1·1	2·3	—	—
July	1007	86	76	90	72	90	78	0	25	16·9	23	3	1	0	1	20	30	11	3	31	3	0	1	0	22	45	19	3	7	1·9	2·6	—	—
August	1007	86	76	90	73	90	76	0	20	14·7	18	1	2	0	1	22	28	10	3	33	4	3	0	0	24	42	17	4	6	1·8	2·7	—	—
September	1008	87	76	90	73	91	78	0	20	14·5	20	3	3	0	1	11	29	15	2	36	5	3	0	1	15	41	23	5	7	1·7	2·5	—	—
October	1008	87	76	90	73	89	77	0	16	10·6	15	9	24	1	3	3	10	14	4	32	16	21	1	1	7	18	23	6	7	1·8	2·5	—	—
November	1008	86	77	90	72	87	76	0	10	5·5	6	19	51	1	2	3	5	3	2	14	29	47	0	2	5	6	6	3	2	2·5	3·0	—	—
December	1009	85	76	88	72	87	77	0	10	2·9	3	21	59	1	2	0	0	2	2	13	33	56	1	3	1	3	3	0	0	2·6	3·0	—	—
Means	1009	87	76	94*	70**	89	75	—	—	—	—	14	30	0	1	7	10	6	2	30	25	26	0	1	10	18	11	5	4	1·9	2·7	—	—
Totals	—	—	—	—	—	—	—	1	155	87·7	120	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values	—	—	—	98†	65††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	15	15	15	15	15	10	10	10	10	35	10	10																		10	10	—	—

Standard of time, 120° E. Meridian.

* Mean of highest each year. ** Mean of lowest each year. † Highest recorded temperature. †† Lowest recorded temperature.

Authorities :—MS. data supplied by Weather Bureau, Manila.
Annual Report of the Weather Bureau, Manila.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—IWAHIG (PUERTO PRINCESA). LAT. 9° 44′ N., LONG. 118° 38′ E. Height above Mean Sea Level, 47 feet ($14^{m}3$).

Climatic Table compiled from 5 to 24 Years' Observations.

MONTH	PRESSURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION																		Mean wind speed ½(0600 + 1400)	No. of days with gale	No. of days with fog or mist
												0600 Percentage of observations from									1400 Percentage of observations from											
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	0600	1400	Clear (less than 2/10)	Cloudy (more than 8/10)	Average fall	No. of days with 0·04 in. or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm			
	mb.	° F.	° F.	° F.	° F.	%	%			in.																				knots		
January . .	1010	88	70	90	66	93	67	1	9	2·4	4	3	1	1	1	16	58	10	1	9	3	17	57	16	1	1	1	3	1	3	—	—
February . .	1010	89	70	91	65	93	64	0·8	9	1·5	2	0	2	0	1	20	61	8	1	7	4	14	60	18	0	0	1	3	0	3	—	—
March . . .	1010	90	70	92	66	92	62	1	8	1·6	3	1	2	1	1	16	65	7	1	6	2	12	60	22	1	1	0	1	1	3	—	—
April . . .	1009	91	72	94	69	93	63	0·8	5	2·1	6	1	1	0	1	18	66	7	0	6	1	8	59	18	3	5	2	2	2	3	—	—
May . . .	1008	91	73	94	71	94	69	0·1	12	6·6	14	1	0	1	2	14	62	8	1	11	4	9	36	14	7	15	7	3	5	2	—	—
June . . .	1008	90	73	93	71	94	71	0·3	16	7·8	15	1	0	1	4	15	58	9	1	11	4	11	26	18	13	9	6	4	9	2	—	—
July . . .	1007	89	73	92	70	93	72	0·2	23	8·7	17	0	0	0	3	15	50	7	2	23	3	6	17	13	15	21	14	4	7	3	—	—
August . .	1007	89	73	92	70	93	71	0·2	17	7·1	16	2	1	0	1	12	56	7	3	18	7	6	16	12	12	21	14	6	6	2	—	—
September .	1008	89	72	92	70	93	71	0·2	19	8·4	16	2	1	1	1	12	53	9	3	18	6	6	11	13	12	19	17	9	7	2	—	—
October . .	1008	88	72	91	70	94	73	0·8	18	10·3	20	2	0	0	2	11	57	8	3	17	5	10	21	13	9	14	12	7	9	2	—	—
November. .	1008	88	72	91	68	94	73	0·2	14	10·8	14	2	1	0	1	16	60	7	1	12	4	18	33	14	6	9	9	6	6	3	—	—
December. .	1009	87	72	90	68	94	71	0·5	11	10·0	10	2	2	1	1	15	60	6	1	12	4	19	49	12	2	4	2	3	5	2	—	—
Means . . .	1009	89	72	94*	65**	93	69	—	—	—	—	1	1	1	1	15	59	8	1	13	4	12	37	15	6	10	7	4	5	2·5	—	—
Totals . . .	—	—	—	—	—	—	—	6	161	77·3	137	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values	—	—	—	98†	59††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	15	15	15	15	15	10	10	10		24	10	10																		5	—	—

Standard of time, 120° E. Meridian.

* Mean of highest each year. ** Mean of lowest each year. † Highest recorded temperature. †† Lowest recorded temperature.

Authorities :—MS. data supplied by Weather Bureau, Manila.
Annual Report of the Weather Bureau, Manila.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—SANDAKAN. LAT. 5° 50′ N., LONG. 118° 07′ E. Height above Mean Sea Level, 152 feet ($46^{m}3$).

Climatic Table compiled from 9 to 47 Years' Observations, 1879 to 1941.

MONTH	PRESSURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION																		Mean wind force		No. of days with gale	No. of days ‡ with fog or mist
												0600									1400												
												Percentage of observations from									Percentage of observations from												
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	0600	1400	Clear (less than 2/10)	Cloudy (more than 8/10)	Average fall	No. of days with 0·04 in. or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	0600	1400		
	mb.	° F.	° F.	° F.	° F.	%	%			in.																				Beaufort			
January	1010	85	74	88	72	91	77	0	19	19·0	19	11	13	1	1	3	8	5	13	45	26	37	6	3	2	2	4	14	6	0·7	1	—	0·1
February	1011	86	74	88	72	91	75	0	14	10·9	13	7	11	1	2	1	6	5	12	55	21	43	9	2	2	2	1	13	7	0·6	1	—	0
March	1010	87	75	90	73	91	74	0	14	8·6	13	8	6	1	2	6	11	7	6	53	19	49	8	3	2	5	1	8	5	0·6	1	—	0
April	1009	89	76	91	74	92	70	0	11	4·5	11	6	5	1	6	6	22	13	7	34	23	47	6	6	2	6	2	7	1	0·8	1	—	0
May	1009	89	76	92	74	92	69	0	11	6·2	10	1	2	0	6	8	36	22	4	21	10	31	11	16	8	11	4	6	3	1	1	—	0
June	1009	89	75	92	73	92	69	0	12	7·4	14	1	1	0	9	12	41	16	3	17	3	16	7	21	18	18	5	5	7	1	1	—	0
July	1009	89	75	91	73	91	69	0	13	6·7	14	0	0	0	8	17	48	14	1	12	3	10	4	20	20	20	11	3	9	1	1	—	0
August	1009	89	75	92	73	91	69	0	13	7·9	12	1	0	0	8	13	35	20	0	23	5	9	6	21	19	21	8	3	8	1	1	—	0
September	1009	89	75	92	73	91	67	0	13	9·3	15	1	0	0	5	13	40	13	2	26	6	8	5	20	19	16	8	5	13	1	1	—	0
October	1009	88	75	91	73	92	70	0	17	10·2	18	4	0	0	6	7	26	14	5	38	13	22	5	13	11	13	7	6	10	0·9	1	—	0
November	1009	87	75	90	73	93	75	0·1	16	14·5	19	2	3	0	3	4	21	17	8	42	15	29	6	6	6	6	5	14	13	0·8	1	—	0
December	1009	86	74	89	73	92	76	0	17	18·5	20	6	6	0	2	2	21	12	10	41	22	29	6	6	5	6	5	12	9	0·9	1	—	0·2
Means	1009	88	75	93*	71**	92	72	—	—	—	—	4	4	0	5	8	26	13	6	34	14	27	7	11	9	11	5	8	8	0·9	1	—	—
Totals	—	—	—	—	—	—	—	0·1	170	123·7	178	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·3
Extreme values	—	—	—	99†	70††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	9	45	45	32	32	9-10	9-10	10		46-47	9-10	10																		9	9	—	10

Standard of time, 120° E. Meridian.

* Mean of highest each year.
** Mean of lowest each year.

† Highest recorded temperature.
†† Lowest recorded temperature.

‡ Days on which visibility falls below ½ nautical mile.

Authority :—MS. data at Meteorological Office.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—JOLO. LAT. 6° 03′ N., LONG. 121° 00′ E. Height above Mean Sea Level, 43 feet (13^{ml}).

Climatic Table compiled from 5 to 41 Years' Observations.

MONTH	PRES-SURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION																		Mean wind speed ‡(0600 + 1400)	No. of days with gale	No. of days with fog or mist
												0600									1400											
												Percentage of observations from									Percentage of observations from											
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	0600	1400	Clear (less than 2/10)	Cloudy (more than 8/10)	Average fall	No. of days with 0·04 in. or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm			
	mb.	° F.	° F.	° F.	° F.	%	%			in.																				knots		
January	1009	85	74	88	70	93	77	0	16	4·8	8	24	16	5	2	6	1	1	1	44	52	28	1	1	1	1	7	6	3	6	—	—
February	1009	86	73	89	69	94	76	0	13	4·1	6	17	10	4	6	7	1	1	1	53	50	24	1	0	2	1	11	8	3	5	—	—
March	1009	86	73	90	70	95	76	0	12	4·2	7	7	7	5	6	13	0	0	0	62	43	19	0	1	3	6	16	8	4	5	—	—
April	1008	87	73	90	70	95	76	0	9	5·4	8	2	3	2	5	9	3	1	1	74	23	13	1	2	3	7	36	9	6	4	—	—
May	1008	87	74	91	72	95	77	0	10	7·5	13	1	1	3	6	11	4	4	1	69	10	7	3	4	12	16	35	7	6	5	—	—
June	1008	87	74	91	71	95	77	0	17	8·5	16	1	2	2	4	14	4	4	1	68	9	11	3	4	20	16	27	5	5	5	—	—
July	1008	87	74	90	71	93	74	0·1	18	6·3	13	1	1	1	4	26	11	6	1	49	5	3	1	4	37	23	22	2	3	7	—	—
August	1008	88	74	91	71	94	73	0	16	6·8	13	0	1	1	4	27	10	4	0	53	6	5	1	4	30	20	25	3	6	6	—	—
September	1008	87	73	91	71	94	74	0	15	7·1	13	1	1	1	3	18	8	4	0	64	6	6	1	2	22	16	41	2	4	6	—	—
October	1008	87	73	90	70	94	76	0	16	8·9	17	2	1	2	4	13	6	9	1	62	11	10	1	2	10	16	38	6	6	6	—	—
November	1008	87	73	90	71	95	76	0	15	7·9	15	5	3	2	3	8	6	8	3	62	18	12	1	3	5	11	38	7	5	6	—	—
December	1008	86	73	89	70	94	76	0·1	13	6·7	10	13	13	1	3	6	4	4	3	53	33	26	1	1	5	4	21	6	3	6	—	—
Means	1008	87	73	92*	68**	94	76	—	—	—	—	6	5	2	5	13	5	4	1	59	22	14	1	2	13	11	26	6	5	6	—	—
Totals	—	—	—	—	—	—	—	0·2	170	78·2	139	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values	—	—	—	94†	65††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	15	15	15	15	15	10	10	10		41	10	10																		5	—	—

Standard of time, 120° E. Meridian.

* Mean of highest each year. ** Mean of lowest each year. † Highest recorded temperature. †† Lowest recorded temperature.

Authorities :—MS. data supplied by Weather Bureau, Manila.
Annual Report of the Weather Bureau, Manila.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—ZAMBOANGA. LAT. 6° 54′ N., LONG. 122° 05′ E. Height above Mean Sea Level, 23 feet (7^m0).
Climatic Table compiled from 5 to 38 Years' Observations.

MONTH	PRESSURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION																		Mean wind speed ½(0600 + 1400)	No. of days with wind force 8 or more	No. of days with fog or mist
												0600									1400											
												Percentage of observations from									Percentage of observations from											
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	0600	1400	Clear (less than 2/10)	Cloudy (more than 8/10)	Average fall	No. of days with 0·04 in. or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm			
	mb.	° F.	° F.	° F.	° F.	%	%			in.																				knots		
January	1009	88	73	92	69	92	70	0	6	2·1	5	14	5	0	0	0	0	0	0	81	4	5	9	13	4	32	26	0	7	3·6	0·1	—
February	1009	88	73	92	69	92	71	0·1	7	2·2	5	13	7	0	0	0	0	0	1	79	2	2	14	17	3	32	26	1	3	3·8	0·1	—
March	1009	89	74	93	70	92	70	0	5	1·5	5	13	6	0	0	0	0	0	0	81	0	3	13	20	2	31	29	0	2	4·2	0·1	—
April	1009	88	74	93	71	93	74	0	7	2·0	6	19	7	0	0	0	1	1	1	71	2	3	7	14	3	35	31	2	3	4·2	0·1	—
May	1009	88	75	92	73	93	76	0	9	3·5	9	26	6	0	0	0	2	3	1	62	1	2	13	17	4	29	27	1	6	4·1	0·1	—
June	1009	88	75	92	72	94	77	0	11	4·2	12	31	5	0	0	0	1	3	3	57	1	1	10	20	10	24	22	2	10	4·0	0·6	—
July	1009	87	74	91	72	94	77	0	13	4·9	12	24	5	0	0	0	6	6	2	57	2	1	8	13	3	28	36	2	7	5·0	2	—
August	1009	88	75	92	72	93	75	0·1	9	4·0	10	22	5	0	0	1	6	4	3	59	1	1	11	15	3	26	34	1	8	4·8	1	—
September	1009	88	74	92	72	94	76	0	10	4·7	11	24	5	0	0	1	5	7	2	56	1	1	7	12	3	32	38	1	5	5·0	1	—
October	1009	88	74	93	72	93	76	0	12	5·6	11	18	6	0	0	1	5	10	2	58	2	1	7	13	4	31	35	2	5	4·8	2	—
November	1009	88	74	92	71	94	75	0	7	4·2	11	22	6	0	0	0	3	2	2	65	2	3	7	20	4	30	24	2	8	4·3	1	—
December	1009	89	73	92	70	93	73	0·4	7	3·4	9	23	7	0	0	1	2	2	1	64	3	6	10	16	2	32	24	1	6	3·5	0·1	—
Means	1009	88	74	94*	68**	93	74	—	—	—	—	21	6	0	0	0	3	3	1	66	2	2	10	16	4	30	29	1	6	4·3	—	—
Totals	—	—	—	—	—	—	—	0·6	103	42·3	106	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	—
Extreme values	—	—	—	96†	66††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	15	15	15	15	15	10	10	10		38	10	10																		5	15	—

Standard of time, 120° E. Meridian.

* Mean of highest each year. ** Mean of lowest each year. † Highest recorded temperature. †† Lowest recorded temperature.

Authorities :—MS. data supplied by Weather Bureau, Manila.
Annual Report of the Weather Bureau, Manila.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—ILOILO. LAT. 10° 42′ N., LONG. 122° 34′ E. Height above Mean Sea Level, 46 feet (14^{m}0).

Climatic Table compiled from 10 to 36 Years' Observations.

MONTH	PRESSURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION																		Mean wind speed ‡(0600 + 1400)	No. of days with wind force 8 or more	No. of days with fog or mist
												0600									1400											
												Percentage of observations from									Percentage of observations from											
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	0600	1400	Clear (less than 2/10)	Cloudy (more than 8/10)	Average fall	No. of days with 0·04 in. or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm			
	mb.	° F.	° F.	° F.	° F.	%	%			in.																				knots		
January . .	1011	85	73	89	70	91	68	1	13	2·5	9	25	74	0	0	0	0	0	0	1	4	89	5	0	0	2	0	0	0	9·4	3	—
February . .	1010	87	74	91	70	90	63	2	9	1·8	5	27	70	0	0	0	0	0	0	3	4	83	11	0	0	2	0	0	0	9·2	1	—
March . . .	1010	88	74	93	72	89	59	2	7	1·3	4	28	68	0	0	0	0	0	0	4	4	78	13	0	1	4	0	0	0	9·3	1	—
April . . .	1009	92	76	95	73	89	59	2	8	1·7	5	25	67	0	0	0	0	0	0	8	1	79	8	0	0	11	1	0	0	7·7	0·3	—
May . . .	1008	91	77	96	74	90	67	0·2	11	6·2	13	20	41	0	1	9	8	0	1	20	2	38	7	1	9	39	2	1	1	5·4	0·3	—
June . . .	1008	89	76	93	74	92	71	0·3	11	10·4	16	8	22	0	1	14	13	1	1	40	1	13	8	1	10	65	1	0	1	5·2	0·3	—
July . . .	1008	87	76	92	73	90	75	0·2	20	17·6	20	4	8	1	2	16	40	2	0	27	2	5	8	1	10	74	3	1	1	6·8	2	—
August . .	1008	87	76	91	73	91	74	0	16	15·2	18	2	10	0	1	20	40	2	1	24	1	7	2	0	10	77	2	0	1	7·6	3	—
September .	1008	88	76	92	73	91	75	0	16	12·4	17	7	14	0	1	18	36	2	0	22	2	10	2	1	10	70	3	1	1	6·6	1	—
October . .	1009	88	75	92	72	92	73	0·2	14	10·6	16	11	35	0	1	9	15	2	1	26	6	33	6	1	7	44	1	1	1	5·7	1	—
November. .	1009	87	75	91	72	93	72	0·5	11	8·3	13	21	59	0	0	4	6	0	0	10	7	61	8	1	4	17	1	0	1	6·9	1	—
December. .	1009	86	74	90	70	93	70	0·7	12	4·7	11	27	63	1	1	1	1	0	1	5	6	76	9	0	1	7	1	0	0	8·2	2	—
Means . . .	1009	88	75	96*	69**	91	69	—	—	—	—	17	44	0	1	8	13	1	0	16	3	48	7	1	5	34	1	0	1	7·3	—	—
Totals . . .	—	—	—	—	—	—	—	9	148	92·7	147	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16	—
Extreme values	—	—	—	98†	67††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	15	15	15	15	15	10	10	10		36	10	10																		16	15	—

Standard of time, 120° E. Meridian.

* Mean of highest each year. ** Mean of lowest each year. † Highest recorded temperature. †† Lowest recorded temperature.

Authorities :—MS. data supplied by Weather Bureau, Manila.
Annual Report of the Weather Bureau, Manila.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—CEBU. LAT. 10° 18′ N., LONG. 123° 54′ E. Height above Mean Sea Level, 30 feet (9ml).

Climatic Table compiled from 10 to 36 Years' Observations.

MONTH	PRESSURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION																		Mean wind speed for 24 hrs.	No. of days with wind force 8 or more	No. of days with fog or mist
												0600									1400											
												Percentage of observations from									Percentage of observations from											
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	0600	1400	Clear (less than 2/10)	Cloudy (more than 8/10)	Average fall	No. of days with 0·04 in. or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm			
	mb.	° F.	° F.	° F.	° F.	%	%			in.																				knots		
January	1010	85	75	88	72	83	65	1	13	4·2	11	70	12	0	0	0	0	1	2	15	18	72	5	1	1	1	0	2	0	6·9	0·5	—
February	1011	86	75	89	73	83	63	1	9	2·9	7	63	15	0	0	0	0	0	5	17	12	77	4	1	2	1	1	1	1	6·8	0·1	—
March	1010	87	76	90	73	83	61	2	7	2·0	6	63	18	2	0	0	0	1	1	15	7	80	7	1	2	1	0	1	1	6·9	0·2	—
April	1009	89	78	92	75	82	60	2	5	1·7	5	45	17	1	0	1	1	2	8	30	6	76	7	2	4	1	1	2	1	6·3	0·4	—
May	1008	89	79	93	75	83	64	2	7	4·5	9	23	10	1	1	1	14	6	5	39	7	42	7	5	28	7	1	1	2	5·5	1	—
June	1008	88	78	92	74	84	66	0·2	10	6·4	13	14	5	0	2	2	22	8	7	40	3	25	5	8	41	12	1	2	3	5·6	2	—
July	1008	87	77	90	73	82	69	0·1	19	7·3	15	5	3	1	1	5	52	9	6	18	2	10	8	6	45	27	2	1	4	7·6	7	—
August	1008	87	78	91	74	81	68	0·2	15	5·6	12	5	1	1	0	2	56	10	5	20	2	9	3	5	50	25	1	2	3	8·0	7	—
September	1008	87	78	91	74	82	68	0·2	16	6·9	13	4	2	1	1	3	46	18	4	26	2	10	3	5	44	25	3	2	6	6·7	4	—
October	1008	88	77	91	74	83	66	0·4	14	7·7	15	23	3	0	0	3	24	9	9	29	5	30	7	5	24	18	4	2	5	5·9	2	—
November	1009	87	77	91	74	84	65	1	11	6·4	11	40	9	2	1	2	8	3	6	29	7	52	7	2	15	9	1	2	5	5·9	1	—
December	1009	86	76	89	72	84	66	0·8	13	5·0	10	57	14	0	0	1	4	3	2	19	14	60	8	2	7	4	1	2	2	6·3	0·4	—
Means	1009	87	77	93*	71**	83	65	—	—	—	—	34	9	1	0	2	19	5	5	25	7	45	5	4	22	11	1	2	3	6·5	—	—
Totals	—	—	—	—	—	—	—	11	139	60·6	127	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	26	—
Extreme values	—	—	—	94†	68††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	15	15	15	15	15	10	10	10		36	10	10																		27	15	—

Standard of time, 120° E. Meridian.

* Mean of highest each year. ** Mean of lowest each year. † Highest recorded temperature. †† Lowest recorded temperature.

Authorities :—MS. data supplied by Weather Bureau, Manila.
Annual Report of the Weather Bureau, Manila.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—APARRI. LAT. 18° 22′ N., LONG. 121° 38′ E. Height above Mean Sea Level, 17 feet (5$^{\text{m}}$2).

Climatic Table compiled from 10 to 36 Years' Observations.

MONTH	PRESSURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION																		Mean wind speed ‡(0600 + 1400)	No. of days with wind force 8 or more	No. of days with fog or mist
												0600									1400											
												Percentage of observations from									Percentage of observations from											
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	0600	1400	Clear (less than 2/10)	Cloudy (more than 8/10)	Average fall	No. of days with 0·04 in. or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm			
	mb.	° F.	° F.	° F.	° F.	%	%			in.																				knots		
January . .	1015	81	68	88	64	89	74	4	16	6·0	14	2	23	16	4	10	10	2	1	32	6	56	26	3	5	0	0	2	2	7·4	0·3	—
February . .	1014	83	69	90	65	90	70	7	12	3·3	8	2	15	13	5	13	9	3	2	38	9	55	24	2	4	2	0	3	1	7·6	0	—
March . . .	1013	86	71	94	67	90	69	8	10	2·4	6	1	15	13	3	15	9	2	1	41	15	58	23	2	1	0	0	1	0	7·5	0	—
April . . .	1011	90	73	97	69	90	66	11	5	1·8	3	5	7	5	6	25	10	1	1	40	13	66	16	2	1	1	0	1	0	6·7	0	—
May . . .	1008	93	75	98	72	91	67	9	8	4·9	9	1	2	1	5	44	16	3	1	27	26	52	7	3	4	2	1	4	1	6·4	0·1	—
June . . .	1007	93	76	98	73	91	65	5	10	6·7	9	0	0	0	4	45	20	6	1	24	21	46	5	3	12	4	1	6	2	6·7	0·1	—
July . . .	1005	91	76	96	73	91	69	3	17	8·5	13	2	1	0	6	41	20	4	1	25	22	35	6	6	15	6	2	5	3	6·5	0·9	—
August . .	1005	91	76	96	73	91	69	3	15	9·5	12	0	0	0	2	43	25	2	2	26	24	33	7	3	8	12	2	8	3	6·3	0·5	—
September .	1007	90	75	95	72	93	71	3	14	11·3	13	1	3	2	1	28	19	8	2	36	24	40	10	5	6	3	1	7	4	6·4	0·5	—
October . .	1010	86	74	92	70	91	75	4	17	14·1	19	6	21	6	3	6	12	5	3	38	14	52	18	3	2	0	1	5	5	6·3	1	—
November. .	1012	83	73	89	68	90	78	3	16	12·8	17	5	26	14	3	3	4	1	1	43	6	59	24	3	2	1	0	2	3	7·2	2	—
December. .	1014	81	70	87	64	91	77	3	19	8·2	15	2	22	18	3	9	4	1	2	39	5	54	29	5	3	0	0	1	3	7·5	0·7	—
Means . . .	1010	87	73	99*	63**	91	71	—	—	—	—	2	11	7	4	24	13	3	2	34	15	51	16	3	5	3	1	4	2	6·9	—	—
Totals . . .	—	—	—	—	—	—	—	63	159	89·5	138	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	—
Extreme values	—	—	—	101†	59††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	15	15	15	15	15	10	10	10		36	10	10																		11	15	—

Standard of time, 120° E. Meridian.

* Mean of highest each year. ** Mean of lowest each year. † Highest recorded temperature. †† Lowest recorded temperature.

Authorities :—MS. data supplied by Weather Bureau, Manila.
Annual Report of the Weather Bureau, Manila.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—LEGASPI. LAT. 13° 09′ N., LONG. 123° 45′ E. Height above Mean Sea Level, 18 feet (5^m5).

Climatic Table compiled from 10 to 36 Years' Observations.

MONTH	PRESSURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION																		Mean wind speed for 24 hrs.	No. of days with wind force 8 or more	No. of days with fog or mist
												0600									1400											
												Percentage of observations from									Percentage of observations from											
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	0600	1400	Clear (less than 2/10)	Cloudy (more than 8/10)	Average fall	No. of days with 0·04 in. or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm			
	mb.	° F.	° F.	° F.	° F.	%	%			in.																				knots		
January . .	1012	84	74	88	70	89	77	1	11	15·4	21	41	41	1	0	0	0	0	1	16	26	68	5	0	0	0	0	0	1	6·6	0·1	—
February . .	1012	86	74	90	70	90	75	5	8	11·5	13	31	33	1	0	0	0	0	1	34	20	70	9	0	0	0	0	0	1	6·3	0	—
March . . .	1012	88	75	91	71	88	72	6	6	7·7	13	31	39	4	0	0	0	0	0	26	9	75	15	0	0	0	0	0	1	6·0	0·1	—
April . . .	1010	90	77	93	72	89	71	6	4	5·9	14	24	37	3	0	0	0	0	2	34	11	70	18	0	0	1	0	0	0	5·4	0	—
May . . .	1009	92	77	95	74	92	71	4	5	6·4	15	8	24	2	0	2	12	5	2	45	7	50	15	1	4	13	7	1	2	3·9	0	—
June . . .	1008	91	77	95	74	93	70	3	6	7·9	13	3	9	1	0	2	21	7	1	56	1	37	13	1	8	32	5	1	2	3·7	0·1	—
July . . .	1007	89	76	94	74	92	75	0·8	15	10·2	19	1	3	1	0	5	45	10	1	34	3	14	6	2	8	50	13	1	3	5·0	0	—
August . .	1007	89	76	94	73	93	73	1	15	7·9	14	1	1	1	0	5	49	8	1	34	3	14	5	2	9	53	12	1	1	5·2	0	—
September .	1007	89	76	94	73	94	76	0·9	13	10·2	17	4	3	2	0	5	42	9	2	33	3	19	7	1	8	45	13	1	3	4·8	0·3	—
October . .	1008	88	75	93	71	93	76	2	11	13·7	19	13	15	2	0	2	20	9	3	36	15	42	7	0	4	18	9	3	2	4·9	0	—
November. .	1009	86	76	91	71	91	78	2	11	18·3	21	37	27	3	1	2	5	3	1	21	23	56	6	1	4	5	2	2	1	5·7	0·5	—
December . .	1011	85	75	89	70	90	80	2	13	20·3	22	43	38	1	0	1	0	1	1	15	22	66	6	0	1	2	1	1	1	6·5	0·1	—
Means . . .	1009	88	76	96*	70**	91	75	—	—	—	—	20	23	2	0	2	16	4	1	32	12	48	9	1	4	18	5	1	2	5·4	—	—
Totals . . .	—	—	—	—	—	—	—	34	118	135·4	201	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—
Extreme values	—	—	—	96†	64††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	15	15	15	15	15	10	10	10		36	10	10																		11	15	—

Standard of time, 120° E. Meridian.

* Mean of highest each year. ** Mean of lowest each year. † Highest recorded temperature. †† Lowest recorded temperature.

Authorities:—MS. data supplied by Weather Bureau, Manila.
Annual Report of the Weather Bureau, Manila.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—SURIGAO. LAT. 9° 48′ N., LONG. 125° 29′ E. Height above Mean Sea Level, 20 feet (6^{m}1).

Climatic Table compiled from 9 to 36 Years' Observations.

MONTH	PRESSURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION																		Mean wind speed ‡(0600 + 1400)	No. of days with wind force 8 or more	No. of days with fog or mist
												0600									1400											
												Percentage of observations from									Percentage of observations from											
	Mean	Daily max.	Daily min.	Highest in each month	Lowest in each month	0600	1400	Clear (less than 2/10)	Cloudy (more than 8/10)	Average fall	No. of days with 0·04 in. or more	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm			
	mb.	° F.	° F.	° F.	° F.	%	%			in.																				knots		
January	1010	83	74	86	70	93	80	0	22	21·4	24	10	16	13	8	10	7	1	0	35	17	35	30	6	2	0	2	3	5	5·9	0·7	—
February	1011	84	73	87	70	93	77	0	16	14·8	18	6	8	12	10	17	6	1	0	40	20	29	35	7	1	0	1	2	5	5·6	0·1	—
March	1010	85	74	88	70	93	76	0·2	16	13·9	21	4	11	13	8	13	4	0	0	47	16	34	35	6	0	0	1	3	5	4·9	0·3	—
April	1010	87	74	90	72	95	76	0·1	11	10·0	19	1	5	5	6	11	6	0	0	66	21	27	33	6	0	2	3	2	6	4·2	0·1	—
May	1009	88	76	92	73	94	72	0·1	12	6·2	13	1	0	0	5	20	6	3	0	65	19	17	25	5	0	6	11	8	9	3·3	0·1	—
June	1008	88	76	93	73	94	70	0	13	4·9	10	1	0	0	6	23	14	3	1	52	17	9	21	4	1	10	18	9	11	3·2	0	—
July	1008	88	76	92	73	89	68	0	19	7·0	13	0	0	0	1	21	27	15	0	36	9	3	5	2	1	29	40	5	6	4·8	0	—
August	1008	88	76	93	73	89	66	0	16	5·1	11	0	0	0	3	23	28	13	0	33	8	3	2	2	1	26	43	9	6	4·8	0	—
September	1008	88	76	93	73	90	68	0	15	6·6	13	0	0	0	2	20	30	16	0	32	9	2	7	1	2	26	39	6	8	5·0	0	—
October	1008	87	75	91	72	91	73	0	20	10·7	17	2	2	0	5	22	22	11	2	34	23	8	11	3	1	16	24	8	6	4·1	0·1	—
November	1009	85	75	90	72	94	78	0	20	16·8	20	4	3	4	5	18	14	4	2	46	25	14	18	6	8	7	8	8	11	4·2	0·4	—
December	1009	83	74	88	71	94	80	0	24	24·4	24	8	9	7	8	9	12	3	1	43	20	27	23	7	2	4	3	3	11	4·4	0·4	—
Means	1009	86	75	94*	69**	92	74	—	—	—	—	3	4	4	6	17	15	6	1	44	17	17	20	5	1	11	16	6	7	4·5	—	—
Totals	—	—	—	—	—	—	—	0·4	204	141·8	203	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—
Extreme values	—	—	—	99†	66††	—	—	—	—	—		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	15	15	15	15	15	10	10	9		36	10	10																		16	15	—

Standard of time, 120° E. Meridian.

* Mean of highest each year. ** Mean of lowest each year. † Highest recorded temperature. †† Lowest recorded temperature.

Authorities :—MS. data supplied by Weather Bureau, Manila.
Annual Report of the Weather Bureau, Manila.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

CHAPTER II

WEST COAST OF MINDORO—MINDORO STRAIT—CALAMIAN GROUP—SULU SEA—CUYO AND CAGAYAN ISLANDS

Chart 3807.

MINDORO.—The island of Mindoro lies close southward of the south-western part of Luzon, the largest of the Philippine islands, and relative to its size, is one of the least populous of the archipelago; it is little known and developed, being extremely mountainous, covered with dense forests, and, in the more level part near the coast, full of marshes, and is very unhealthy. The inhabitants of the coasts are Tagals, but in the interior there is a low tribe of Malayan race, probably the aborigines of the island, and called Manguianes, speaking a peculiar language and living in a very primitive manner on the products of a rude agriculture.

Mount Halcon, in the northern part of Mindoro, is 8,481 feet (2,585^{m}0) high, and is one of the highest mountains in the northern Philippines.

Climate and weather.—*See* page **16.**

WESTERN SIDE OF MINDORO.—Coast.—Light.—From Cape Calavite (Kalavite) (*Lat. 13° 27′ N., Long. 120° 18′ E.*), the north-western extremity of Mindoro, to Buruncan (Burunkan) point, the southern extremity of the island, the west coast is generally bold, the only important danger being Mamburao reef, about 24 miles south-eastward of Cape Calavite. With this exception all dangers may be avoided by giving the coast a berth of at least 2 miles. There are no harbours or anchorages on this coast that afford shelter in all winds. The beach is generally low and sandy, and the land rises gradually to the mountain range inland.

Chart 3816.

Mount Calavite (Kalavite), 4,990 feet (1,520^{m}9) high, is the summit of a promontory, the western slope of which terminates in Cape Calavite, and the northern slope in Del Monte point; the summit of the mountain appears dome-shaped from westward, but from northward and southward shows a fairly level ridge highest at its western end.

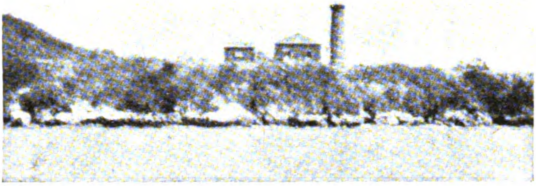
A light is exhibited, at an elevation of 137 feet (41^{m}8), from a white circular steel tower, on Cape Calavite.

Between Cape Calavite and Pantocomi (Pantokomi) point, 6¾ miles south-eastward, there are a few rocks lying close offshore.

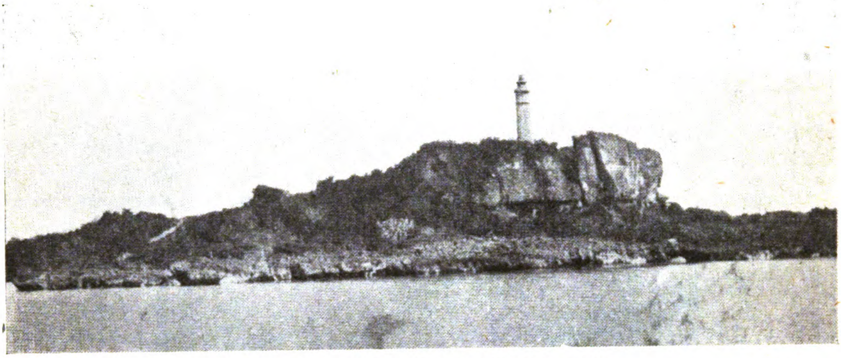
Paluan bay and approach.—Danger.—Anchorages.—Paluan

Charts 943, 2661b, 1263.

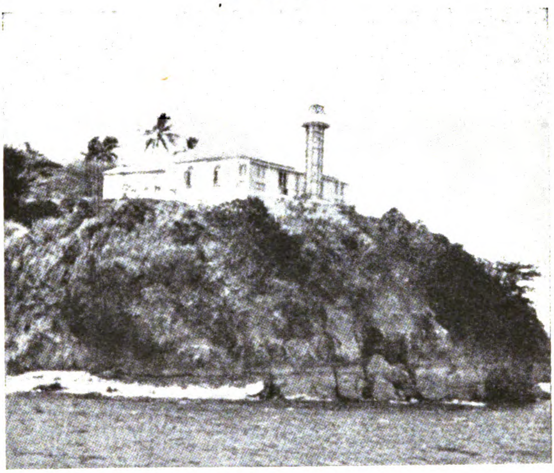
VIEWS OF LIGHTHOUSES



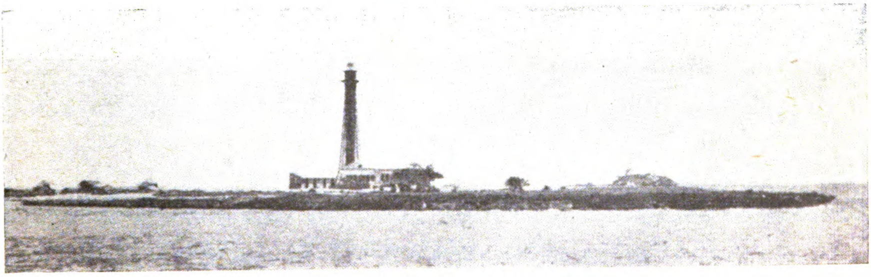
Cape Santiago lighthouse, bearing about 090°, distant half a mile.
(*See page* 306.)



Maniguin Island lighthouse.
(*See page* 334.)

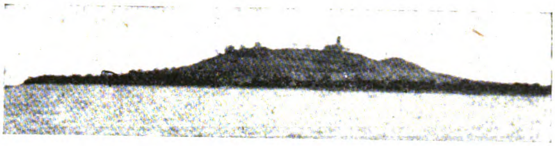


Lusaran Point lighthouse.
(*See page* 337.)



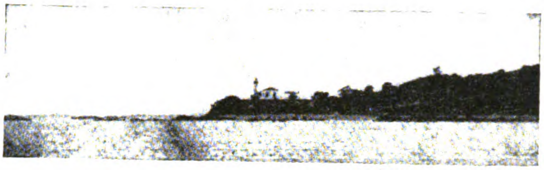
Tanguingui Islet lighthouse.
(*See page* 356.)
(*All originals dated* 1908.)

VIEWS OF ISLANDS AND LIGHT-STATIONS



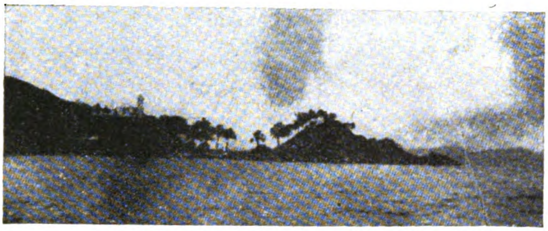
Jintotolo island, bearing about 022°, distant about one mile.

(*See page* 354.)



North Gigante lighthouse from westward, distant three-quarters of a mile.

(*See page* 355.)

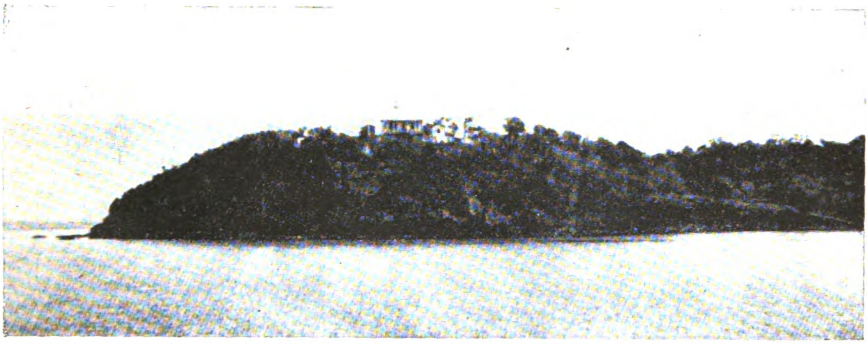


Calabazas Island lighthouse, bearing 045°, distant half a mile.

(*See page* 362.)

Ocata island.

(*See page* 536.)



Bagatao Island lighthouse, from southward.

(*See page* 392.)

(*All originals dated* 1908.)

Chart 3816.

bay, entered between Pantocomi point and Camtas (Kamtas) point, 4¾ miles eastward, affords good shelter during the North-east monsoon. The entrance points are each fringed by a reef which dries, extending a quarter of a mile offshore. Shoal water was reported, in 1945, to be extending southward from Pantocomi point.

Two patches, with depths of 8 and 9 fathoms ($14^{m}6$ and $16^{m}5$) over them, lie about 1¼ miles west-south-westward and south-south-westward, respectively, of Camtas point. A reef, with a depth of 4 fathoms ($7^{m}3$) over it, lies about 2¼ miles south-south-westward of the same point and 1½ miles offshore.

The town of Paluan is situated on the southern side and the village of Lipa on the northern side of the entrance to the Paluan river which flows into the north-eastern side of the bay.

The best anchorage is in a depth of 14 fathoms ($25^{m}6$), black mud, about 1½ miles westward of the northern entrance point of Paluan river. A more convenient anchorage may be obtained with Paluan church bearing 100°, in depths of from 7 to 12 fathoms ($12^{m}8$ to $21^{m}9$), mud. A fairly protected anchorage may be obtained during the South-west monsoon, in a depth of 14 fathoms ($25^{m}6$), mud, in Pamatusin (Pamutusin) cove, on the western side of Paluan bay. Squalls sometimes blow violently off the high land, are very sudden, and at night give no warning.

Coast.—Dangers.—Anchorages.—Binarera point (*Lat. 13° 18′ N., Long. 120° 29′ E.*), 4¼ miles southward of Camtas point, is high, rocky, and steep-to. About 2½ and 5 miles south-south-eastward of Binarera point are Igsoso point and Tubile (Tubili) point, the entrance points of Igsoso bay. Tubile point is the termination of a densely wooded peninsula connected with the mainland by a low isthmus. A bank, with a depth of 16 feet ($4^{m}9$) over it, extends about half a mile southward from Tubile point.

Between Tubile point and Sablayan point (chart 3819), about 28 miles south-eastward, the coast is generally low with a sandy beach.

Mamburao bay, entered on the southern side of Tubile point, affords good anchorage, except during the South-west monsoon. Mamburao river flows into the bay about 3¾ miles eastward of Tubile point; depths of from 2 to 3 feet ($0^{m}6$ to $0^{m}9$) can be carried over the bar at the entrance at low water. The village of Mamburao stands on the eastern side of the entrance to the river. The galvanised iron roof of the school building is visible about 4 miles.

Mamburao reef, awash near its north-western end, lies with its outer edge 3 miles south-south-westward of Carauisan (Karauisan) point, situated about 5 miles east-south-eastward of Tubile point. A reef, with a sunken rock near its outer end, extends about 1¼ miles south-south-westward from Carauisan point, and two 16-foot ($4^{m}9$) patches lie about one mile westward and south-westward, respectively, of the same point. A rock, with a depth of less than 6 feet ($1^{m}8$) over it, lies about 1¾ miles southward of the point.

Good anchorage may be obtained by vessels with local knowledge, except during the South-west monsoon, in a depth of 5 fathoms ($9^{m}1$), mud and sand, about half a mile south-westward of Mamburao village. Vessels approaching the anchorage should keep the village bearing between 024° and 067° to avoid Mamburao reef and the foul ground extending from the northern shore of the bay.

Charts 3807, 943, 2661b, 1263.

Chart 3819.

Between Carauisan point and Talabasi point, about 10½ miles south-south-eastward, and thence to Sablayan point, the coast is low, and intersected by many rivers, but it rises gradually inland to mountainous country.

A rock, with a depth of 3 feet ($0^{m}9$) over it, lies about half a mile offshore, about 5½ miles south-eastward of Carauisan point.

Pandan islands and bay.—Dangers.—Pandan islands consist of two islands, the northern of which is about 150 feet ($45^{m}7$) high, and the southern 100 feet ($30^{m}5$), and both densely wooded, lying from one to 2 miles north-westward of Sablayan point. The channel between the islands is clear of danger, but that between the southern island and the point is foul.

Pandan bay lies between the Pandan islands and the main island eastward of them. A reef, with a depth of 13 feet ($4^{m}0$) over it, lies 1¼ cables north-eastward of the north-eastern extremity of the southern of the Pandan islands; two reefs, with depths of 7 and 27 feet ($2^{m}1$ and $8^{m}2$) over them, lie about 6 cables eastward and 4½ cables north-eastward, respectively, of the same point.

Anchorage may be obtained in the southern part of Pandan bay with good protection during the South-west monsoon, in depths of from 7 to 14 fathoms ($12^{m}8$ to $25^{m}6$), mud, about a quarter of a mile from the north-eastern side of the southern of the Pandan islands.

Coast. — Dangers. — Beacon. — Anchorages. —Sablayan point (*Lat. 12° 50′ N., Long. 120° 46′ E.*) is the termination of a small peninsula extending about half a mile south-westward, and on which is a wooded knoll, 120 feet ($36^{m}6$) high. A coral reef, which dries, fringes the point, and extends about 1½ cables offshore. The peninsula forms the western side of a bay about three-quarters of a mile wide at its entrance, but this is considerably reduced by reefs on both sides, and the northern part is encumbered by reefs which enclose a small lagoon, with depths of from 4 to 5 fathoms ($7^{m}3$ to $9^{m}1$), to which there is a narrow entrance. There are many rocky heads above water in the northern part of the bay and sunken rocks lie within 3½ cables of the shore in the southern part.

The town of Sablayan is situated on the western side of the bay; the church, in the southern part of the town, at the foot of the wooded knoll, is partly obscured by coconut trees. Landing by ship's boats is almost impossible at low water in front of the town on account of the numerous coral heads; at this state of the tide landing can be effected at the mouth of the river at the head of the bay, where there is a break in the shore reef.

Anchorage may be obtained, in a depth of 16 fathoms ($29^{m}3$), rock, about 2½ cables from the church, with Sablayan point bearing 270°. Vessels are recommended not to bring Sablayan point to bear less than 270°, as the bottom is rocky and uneven, and the depths decrease rapidly towards the reefs. Small craft with local knowledge, may, however, anchor with the church bearing 270°, distant 3¾ cables, or may enter the lagoon.

Between Sablayan point and Dongon point, 6¾ miles southward, the coast is fringed by a reef in places, depths of less than 3 fathoms ($5^{m}5$) extending about three-quarters of a mile offshore within 2 miles of Dongon point. Dongon point is low and sandy, and is the north-western entrance point of Dongon bay, in which anchorage may be

Charts 3807, 943, 2661b, 1263.

Chart 3819.

obtained by vessels with local knowledge, protected from northerly and easterly winds.

Irirun rock, about 40 feet (12^{m}2) high, lies about three-quarters of a mile offshore and about 8 miles south-eastward of Dongon point, and is fringed by a coral reef. A coral reef, which dries, lies about three-quarters of a mile north-north-westward of Irirun rock, and the same distance offshore, and a reef, with a depth of 2 fathoms (3^{m}7) over it, lies about 3 cables farther northward and half a mile offshore.

Irirun bay, entered about 1¼ miles south-eastward of Irirun rock, affords good anchorage for small craft with local knowledge during the North-east monsoon. Tusk peak, about 6 miles north-eastward of Irirun rock, is 2,966 feet (904^{m}0) high, and prominent.

About 6¼ miles southward of Irirun rock, the Lumintao river flows out ; it is shallow and is of no use to navigation. Between the entrance to this river and Bubug point, 12 miles south-eastward, the coast is low and steep-to, with a sandy beach, behind which there is a sandy terrace, from 6 to 12 feet (1^{m}8 to 3^{m}7) high ; the vegetation consists of trees from 20 to 60 feet (6^{m}1 to 18^{m}3) high, and in places grass extends to the beach. There is no coral fringing this part of the coast except at Bugsanga point on the southern side of the mouth of the river of that name, situated 6½ miles south-south-eastward of the southern entrance point of Lumintao river, where there is a small coastal reef about half a cable wide, with a sand and coral spit, with depths of from 6 to 8 fathoms (11^{m}0 to 14^{m}6). The bar of Bugsanga river is very shallow.

At San Agustin, close southward of the mouth of Bugsanga river there is a pier, but its outer end was destroyed in 1936, and it cannot be used by vessels. It is connected by railway with San Jose, about 4 miles north-eastward.

There is a white beacon on the coast about 2½ miles south-eastward of the mouth of Bugsanga river.

About 1½ miles north-westward of Bubug point (*Lat. 12° 22′ N., Long. 121° 02′ E.*) there is a narrow rocky ledge about half a mile long lying about a quarter of a mile offshore, with a least depth of 1¼ fathoms (2^{m}3) over it, and running parallel with the coast. Vessels anchoring in this vicinity should not proceed into a depth of less than 7 fathoms (12^{m}8).

Chart 971.

Mangarin bay.—Islets and dangers.—Beacons.—Buoys.— Mangarin bay, formed between the coast of Mindoro and the northern side of Ilin island, is easy of access and affords good anchorage for all classes of vessels at most seasons of the year. It may be entered from north-westward or westward or through Ilin strait. The village of Pandurucan (Pandarochan), the seat of government of the municipality of San Jose, about 1½ miles east-south-eastward of Bubug point, contains several low, iron-roofed buildings.

Caminawit (Kaminawit) point is low, with several prominent warehouses on it, extending south-eastward from the northern side of the bay, the area between it and the head of the bay being shallow and of little value to navigation. The village of Mangarin stands on the northern shore of the bay, about 1½ miles north-north-eastward of Caminawit point, and is only accessible to small craft.

Caminawit point had, in 1927, extended considerably since the last survey in 1910.

Charts 3807, 943, 2661b, 1263.

Chart 971.

Ilin island, which is wooded, is fringed on its northern and eastern sides by narrow and steep-to reefs, and from its western side at the northern end a reef, which dries, extends nearly one mile westward; the remainder of the western side is fringed by reefs, which at no place extend more than half a mile offshore.

Mount Ilin, 762 feet ($232^{m}3$) high, at the northern end, and Mount Natangdol, 790 feet ($240^{m}8$) high, near the southern end, are the highest points of the island; the latter hill is the summit of a sharp ridge running in a north-north-westerly and south-south-easterly direction, and is the most conspicuous feature of the island from all directions except the north. Ilin village is situated on the western side of the island, about 3 cables northward of Salongsogon point, the western extremity.

Sardine reef, a coral reef, with a least depth of 2¼ fathoms ($4^{m}1$) over it, and steep-to on its western side, lies about 1¾ miles westward of the northern part of Ilin island.

Dongon (Donjon) reef, on the eastern side of which is a cay of broken coral and sand, lies 4½ miles westward of Caminawit point, and in the fairway of the approach to Mangarin bay from westward. The channel between Dongon reef and Ilin island, and that between Dongon reef and Manadi islet, about 2 miles eastward, is deep and clear of danger.

Manadi islet (*Lat. 12° 20′ N., Long. 121° 03′ E.*) is a sand cay with some trees on it, about 20 feet ($6^{m}1$) high, lying on the eastern part of a shoal which dries.

Cajui (Kajui) reef, about three-quarters of a mile eastward of Manadi islet, dries about 3 feet ($0^{m}9$), and is marked by piles; it is surrounded by coral rocks awash at low water. About one cable north-eastward of the reef is a shoal, with a least depth of 1½ fathoms ($2^{m}7$) over it, and about half a mile north-north-eastward there is a 3-foot ($0^{m}9$) patch moored close north-westward and south-eastward of it, respectively.

A rocky patch, with a depth of 3¼ fathoms ($5^{m}9$) over it, lies about one mile northward of Manadi islet and 6½ cables offshore.

Ilin rock, with a depth of one fathom ($1^{m}8$) over it, and steep-to, lies about 1¼ miles southward of Manadi islet.

A 5-fathom ($9^{m}1$) patch lies about one mile north-north-westward of Calalayuan (Kalalaiyojan) point, the north-eastern extremity of Ilin island.

Liscum (Liskum) reef, with a least depth of one fathom ($1^{m}8$) over it, lies on the eastern side of the channel in the approach from Ilin strait, about 6½ cables north-north-eastward of Calalayuan point. Vessels should not attempt to pass eastward of the reef. The channel between the reef and Calalayuan point is deep and clear of danger. A 3¼-fathom ($5^{m}9$) patch lies about 4 cables northward of Liscum reef.

A shoal, with a depth of 1¾ fathoms ($3^{m}2$) over it, lies about 1¼ cables south-south-westward of the light-structure on Caminawit point.

Wharf.—Light.—There is a wharf on the north-eastern side of Caminawit point, which accommodates vessels up to 250 tons; it is connected to the railway which runs to San Jose. A depth of 21 feet ($6^{m}4$) can be carried at low water in the channel approaching the wharf, but vessels without local knowledge should not use it.

A light is exhibited at the south-eastern extremity of Caminawit point.

Anchorage.—Directions.—Anchorage may be obtained in Man-

Charts 3819, 3807, 943, 2661b, 1263.

garin bay with the warehouses on Caminawit point bearing about 065°, according to the draught of the vessel. A good berth is in a depth of 6 fathoms ($11^{m}0$), mud, on that bearing, distant about three-quarters of a mile from the point.

A vessel from north-westward should pass about three-quarters of a mile westward and southward of Manadi islet and anchor in the berth given above. If entering Mangarin bay by the western channel she should not bring the western extremity of Ambulong (Ambolon) island to bear more than 175° until the northern extremity of Ilin island bears 085°, or Caminawit point bears 065°, to avoid Sardine reef; when Caminawit point is on the latter bearing she may steer for it and anchor as directed above.

A vessel from southward should pass about half a mile westward of Ambulong island, and steer 000° until Caminawit point (*Lat. 12° 20′ N., Long. 121° 05′ E.*) bears 065° when she should steer for it on that bearing and anchor as directed above. A vessel from Ilin strait should steer for Manadi islet as soon as it bears 311°, which will lead south-westward of Liscum reef; when Caminawit point bears 030° she should alter course northward, taking care to avoid the 5-fathom ($9^{m}1$) patch three-quarters of a mile westward of Liscum reef; when Caminawit point bears 065° she should steer for it on that bearing and anchor as directed above.

Tidal streams.—Tidal streams with a rate of 1½ knots have been observed in Mangarin bay.

Radio station.—There is a radio station at San Jose. *See* page 14.

Ilin strait.—Ilin strait, between Mindoro and Ilin island, is deep and clear of danger in the fairway. Bancal (Bankal) point is the eastern entrance point of the northern end of the strait, and about one mile southward of it is Caguray (Kagurai) point, which is low and covered with mangroves, with the shore bank extending about 1½ cables from it. Caguray river, which discharges on the northern side of the point, is navigable by boats to Caguray (Kagurai) village, about 1¾ miles from the entrance.

Lalawigan (Lalauigan) bay, entered between Caguray point and Lalawigan (Lalauigan) point, about 1¼ miles south-south-eastward, is very shallow. Santa Teresa village stands on the shore about half a mile south-south-eastward of Lalawigan point, and Santa Teresa hill, 400 feet ($121^{m}9$) high, round-topped and prominent, lies about 1¼ miles eastward of the point. Cominauet (Kominauet) point, the eastern entrance point of the southern end of Ilin strait, is a low rocky bluff, fringed by a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extending 6 cables offshore.

Anchorage.—Directions.—Good protected anchorage may be obtained in Ilin strait, in depths of from 14 to 16 fathoms ($25^{m}6$ to $29^{m}3$), mud, about 1¼ cables from the beach on the Mindoro side and abreast a remarkable high feathery-topped tree, about half a mile northward of the mouth of the Caguray river. From this anchorage Manadi islet will be seen open of the north-eastern point of Ilin island, and the south-eastern point of Ilin island open of Caguray point.

A vessel entering Ilin strait from northward should keep Manadi islet astern, bearing 311°, so as to clear Liscum reef. In passing through the strait she should favour the Ilin island side, as the depths decrease

Chart 971.

suddenly on the Mindoro side. After clearing the strait she should keep it open astern until the southern extremity of Garza island (*see* below) is in line with Buruncan (Burunkan) point, bearing about 094°, when she should steer 125° until Garza island bears 001°, which course will lead south-westward of the reef extending southward from that island.

A vessel entering the strait from southward and eastward should pass about 3½ miles southward of Garza island, and follow the directions given above in the reverse manner.

Pandarochan bay.—Pandarochan bay, in the southern approach to Ilin strait, is entered between Mangsoagui point (*Lat. 12° 10′ N., Long. 121° 08′ E.*), the south-eastern extremity of Ilin island, and Buruncan point, about 7 miles east-north-eastward. On the western side of the bay, on Ilin island, is Manimoc (Manimok) hill, 323 feet ($98^{m}4$) high, close within Tabai point, about 2¾ miles north-north-westward of Mansoagui point. The northern shore is low, and sandy, with mangroves and scrub behind it. Several rivulets, with bars which nearly dry, flow into the northern part of the bay. Alibug village stands close eastward of the point of the same name, about 1½ miles north-westward of Buruncan point.

Buruncan point is composed of low limestone cliffs, much under-worn by the sea. The land northward of the point rises steeply, and is 253 feet ($77^{m}1$) high about 3½ cables from the point.

Garza island, 2¼ miles westward of Buruncan point, is a small sand and coral cay covered with mangroves and small trees, some of which are about 60 feet ($18^{m}3$) high. It is fringed by a coral reef which dries. A spit, with depths of one fathom ($1^{m}8$) over it, extends a quarter of a mile northward from the island, and from its southern side a bank, with irregular depths of from 3 to 9 fathoms ($5^{m}5$ to $16^{m}5$) over it, extends 2 miles southward. Between Garza island and Mindoro there is a deep channel 4¼ cables wide between the 5-fathom ($9^{m}1$) lines on either side.

There are tide-rips off the southern extremity of the bank extending from the southern side of Garza island.

Ambulong island.—Light.—Ambulong (Ambolon) island is separated from the western side of Ilin island by Ambulong strait, which is about 3 cables wide between the shoals on either side and clear of dangers in the fairway. Ambulong island is wooded and is 567 feet ($172^{m}8$) high south-eastward of Buluang point, the north-western extremity. Ambulong (Ambolon) village is situated on the eastern side of the island, about one mile from the northern extremity.

Bognao inlet, on the western side of Ambulong island, is a lagoon with a narrow entrance. There is a depth of one fathom ($1^{m}8$) in the entrance and greater depths inside over a small area, the remainder of the lagoon being encumbered by reefs.

Cucurrayan (Kukurrayan) inlet, at the south-eastern end of the island, is nearly blocked in its entrance by Buri islet and its surrounding reefs. There is a narrow channel eastward and northward of Buri islet leading to a very contracted anchorage. Lininob rock, 25 feet ($7^{m}6$) high, with a tree on it, lies on the reef extending about one cable southward from Talaotao point, the north-eastern entrance point of the inlet; a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends 1½ cables southward from the rock.

Charts 3819, 3807, 943, 2661b, 1263.

Chart 971.

A light is exhibited, at an elevation of 446 feet (135^{m}9), from a white steel framework tower, on the western part of Ambulong island.

Silong bay.—Dangers.—Silong bay, between the southern end of Ambulong island and Paojican (Paojikan) point, the south-western extremity of Ilin island, affords a convenient anchorage during northerly winds, but the holding ground is not good. In the north-eastern part of the bay, southward of Pagi point, situated about 3 miles north-westward of Paojican point, there are several shoals, with depths of from about 2 to 16 feet (0^{m}6 to 4^{m}9) over them. Davis rock, awash, lies on the edge of the reef which fringes the western side of Ilin island, about 6 cables southward of Bogton point, situated about three-quarters of a mile southward of Salongsogon point.

In the south-western approach to Silong bay, about one mile south-south-eastward of Pabugan point, the southern extremity of Ambulong island, is Baniaga reef, on the western edge of which there is a rock awash. Baniaga rock, 15 feet (4^{m}6) high, lies on the southern edge of the reef. Between Baniaga reef and Pabugan point there is a deep channel clear of dangers. About 1½ miles east-north-eastward of Baniaga rock is a rocky patch, with a depth of 4¾ fathoms (8^{m}7) over it.

Chart 3819.

MINDORO STRAIT.—This wide strait, separating the Calamian islands from the island of Mindoro, is frequently used by steam vessels trading between Manila and the southern islands and Palawan.

It is divided into two passes by Apo island and reef.

Apo island.—Light.—Apo island lies near the middle of Mindoro strait, about 23 miles westward of Dongon point. The island is low and wooded; white sandy beaches border its eastern and southern sides, and the reef fringing the island extends half a mile off in places. There is no good anchorage off the island. Apo island is separated from Apo reef, eastward of it, by a deep channel about one mile wide.

A light (*Lat. 12° 40′ N., Long. 120° 25′ E.*) is exhibited, at an elevation of 130 feet (39^{m}6), from a black steel tower, with a white lantern, on the north-eastern side of Apo island.

Apo East pass.—Dangers and bank.—Apo East pass, between Apo reef and the western side of Mindoro, is 15 miles wide, and, with the exception of Discovery bank, is deep and clear of dangers. This bank, which has a depth of 9 fathoms (16^{m}5) over it, lies about 9 miles west-south-westward of Dongon point; the sea does not break on the bank, nor is it marked by discoloration.

Apo reef is an extensive danger in which there are two shallow lagoons, separated by a channel entered from westward. In the northern lagoon are the Cayos del Bajo, consisting of two rocks, 8 and 20 feet (2^{m}4 and 6^{m}1) high, respectively, and numerous coral heads awash, with depths of from one to 3 fathoms (1^{m}8 to 5^{m}5), sand, between them. There are numerous rocks, which dry, especially along the northern side of the reef, and there are some rocks above water towards the eastern edge. The wreck of a steamer lies on the northern extremity of the reef and is a useful mark. The whole of the reef is steep-to. The southern lagoon lies eastward of Apo island, and Menor islet, wooded and about 25 feet (7^{m}6) high, lies at the north-western

Charts 3807, 967, 943, 2661b, 1263.

extremity of the southern lagoon. Vessels with local knowledge may obtain anchorage, in a depth of about 15 fathoms ($27^{m}4$), in the channel between the lagoons about 2 miles eastward of Menor islet.

Directions.—A vessel navigating Apo East pass should, both by day and night, pass about 4 miles westward of Cape Calavite, thence about the same distance off Pandan islands and Dongon point, thence 1¾ miles westward of Ambulong island. Apo reef should be avoided, as it does not always break, and the soundings give no warning of its approach.

Apo West pass.—Islands and dangers.—Apo West pass, between Apo reef and the north-eastern islands of the Calamian group, is about 20 miles wide.

Merope rock, with a depth of 14 feet ($4^{m}3$) over it, and on which the sea breaks, lies about 10 miles west-north-westward of Apo island; a bank, with depths of less than 6 fathoms ($11^{m}0$) over it, extends about one mile northward from the rock. Hunter rock, on which the sea breaks, with a depth of 7 feet ($2^{m}1$) over it, lies 13½ miles westward of Apo island. Depths of 10 fathoms ($18^{m}3$) or less extend about half a mile north-eastward from Hunter rock.

Colocoto (Kolokoto) rocks are four precipitous black rocks, the highest of which has an elevation of 214 feet ($65^{m}2$), situated on the south-western side of the pass, and about 25 miles west-south-westward of Apo island. A shoal, with a depth of 46 feet ($14^{m}0$) over it, lies about 2 miles south-westward of Colocoto rocks.

Dumunpalit island (*Lat. 12° 23′ N., Long. 120° 07′ E.*), 297 feet ($90^{m}5$) high, and wooded, with several rocks above water lying on the same reef, which is steep-to, lies about 6¾ miles south-eastward of Colocoto rocks. A bank, with a depth of 7 fathoms ($12^{m}8$) over it, extends about 4 cables north-westward from the island.

Nanga islands are two wooded islands, 248 and 173 feet ($75^{m}6$ and $52^{m}7$) high, lying on a reef on which there are some rocks above water, situated 8½ miles east-south-eastward of Dumunpalit island. A rock, 95 feet ($29^{m}0$) high, and steep-to, lies one mile north-eastward of the northern island. Several patches, with depths of 8 and 9 fathoms ($14^{m}6$ and $16^{m}5$) over them, lie from about 2½ to 4 miles westward of the northern island.

Camanga (Kamanga) island, 213 feet ($64^{m}9$) high, with several small rocky islets near it, lies about 2 miles south-south-westward of the southern of the Nanga islands. The westernmost rocky islet is 90 feet ($27^{m}4$) high and bold. Neither the Nanga islands or Camanga island are inhabited.

Tara island, 477 feet ($145^{m}4$) high, lies about 4½ miles south-eastward of the Nanga islands; the upper slopes of the hills are bare of trees and brown, but in the rainy season have a distinct greenish tint; the lower slopes and valleys are covered with bamboo and jungle.

A reef extends about 7 cables north-north-westward and westward from the north-western end of the island. The western side of the island is bordered mostly by a sandy beach with a wide coral reef and there are several off-lying rocks, above and below water. The eastern side is mostly rocky with steep bluffs. A good anchorage may be obtained off the village on the western side, in a depth of 17 fathoms ($31^{m}1$). There is a small stone pier in a break of the reef, which makes a good landing place.

Charts 3807, 967, 943, 2661b, 1263.

Chart 3819.

A bank, with a depth of 33 feet (10^{m}1) over it, lies about 1½ miles northward of Tara island.

Lagat, Bantac (Bantak) and Calanhayaun (Kalanhayaun) islands, lying southward of Tara island, are wooded and dark in colour. Lagat island, 261 feet (79^{m}5) high, is very steep and has nearly bare eroded cliffs which show red or yellow through the sparse vegetation. A coral reef extends about 3 cables south-eastward from the south-eastern extremity of the island, and a detached reef, with a depth of 7 feet (2^{m}1) over it, lies about three-quarters of a mile north-westward of the island.

Bantac island, 396 feet (120^{m}7) high, and Calanhayaun island, 248 feet (75^{m}6) high, southward of it, are connected by a coral reef. Two detached rocks, 40 and 59 feet (12^{m}2 and 18^{m}0) high, respectively, lie about 3 and 1½ cables off the western side of Bantac island, and a rocky islet, 30 feet (9^{m}1) high, lies about 7 cables westward of Calanhayaun island.

A bank, on which there is a rock, 15 feet (4^{m}6) high, and a depth of 7 fathoms (12^{m}8) at its outer end, extends about 8 cables north-north-westward from the northern end of Bantac island, and a spit, with a depth of 1½ fathoms (2^{m}7) over it, extends about 2 cables southward from the southern extremity of the island.

Lubutglubut island (*Lat. 12° 11′ N., Long. 120° 23′ E.*), 366 feet (111^{m}6) high, and some brown rocks, 163 feet (49^{m}7) high, both barren, lie about 8 cables south-westward and 2 miles south-south-westward, respectively, of the southern extremity of Calanhayaun island.

Dangers and banks in southern entrance and approach to Mindoro strait.—Ambulong bank, with a depth of 34 feet (10^{m}4) over it, lies about 7 miles westward of Ambulong island light-structure. Banks, with depths of 10 and 13 fathoms (18^{m}3 and 23^{m}8) over them, lie about 10 and 13 miles, respectively, west-north-westward of Ambulong island light-structure. Sarraceno bank, with a depth of 15 fathoms (27^{m}4), coral, over it, and an 8-fathom (14^{m}6) patch lie about 11½ and 21 miles, respectively, westward of the same light-structure.

Leonidas bank, with a least depth of 8 fathoms (14^{m}6), coarse sand, shells and coral, over it, lies about 12½ miles south-westward of Ambulong island light-structure, and Kambal reef, with a depth of 31 feet (9^{m}4) over it, lies about 5½ miles westward of Leonidas bank. A 7-fathom (12^{m}8) patch lies 1½ miles southward of Kambal reef.

Framjee bank, with a least depth of 16 feet (4^{m}9) over it, lies about 12 miles eastward of Bocao (Bokao) point, the south-eastern extremity of Busuanga island. Several banks, with depths of from 8 to 10 fathoms (14^{m}6 to 18^{m}3) over them, lie within 10½ miles east-south-eastward and 6 miles south-eastward of Framjee bank.

Magallanes bank, with a least depth of 22 feet (6^{m}7) over it, lies about 10 miles south-eastward of Bocao point. Alpha shoal, with a depth of 19 feet (5^{m}8) over it, and Narvaez bank, with a depth of 21 feet (6^{m}4) over it, lie about 9 and 13 miles, respectively, south-south-eastward of Bocao point. For islands and dangers farther westward, *see* page 51. Aguirre reef, with a depth of 3 fathoms (5^{m}5) over it, and Panay bank, with a depth of 7 fathoms (12^{m}8) over it, lie about 19 miles east-south-eastward and 19½ miles south-eastward, respectively, of Calis (Kalis) point (page 51), the southern extremity of Coron (Koron) island. A

Charts 3807, 967, 943, 2661b, 1263.

Chart 3819.

5-fathom (9^m1) patch lies about 3½ miles westward of the southern extremity of Panay bank.

Banks, with depths of less than 8 fathoms (14^m6) over them, are usually marked by discoloration, but vessels should avoid depths of less than 10 fathoms (18^m3), as large coral boulders lie on some of them and the least depth may not have been found during the survey.

Coutts bank, with a depth of 8 fathoms (14^m6) over it, lies about 22 miles southward of Ambulong island light-structure, and Falmouth bank, with a depth of 7 fathoms (12^m8) over it, lies about 6 miles south-westward of Coutts bank. A bank, with a depth of 15 fathoms (27^m4) over it, lies about 14 miles southward of Coutts bank. Areta shoals, with depths of 30 and 34 feet (9^m1 and 10^m4) over them, lie about 8½ and 11 miles, respectively, south-westward of Falmouth bank.

Chart 971.

Dominga shoal, with a depth of 4 fathoms (7^m3), coral and sand, over it, lies about 8½ miles south-south-eastward of Ilin point (*Lat. 12° 09′ N., Long. 121° 07′ E.*), the southern extremity of Ilin island. A 9-fathom (16^m5) patch lies about 2¼ miles southward of Dominga shoal.

Chart 3821.

Panagatan cays are three small wooded islets on a reef, which partly dries, lying about 5 miles westward of Sibay island (page 327); the south-eastern end of the reef is steep-to. Panagatan Malaki, the largest islet, at the western extremity of the reef, is 55 feet (16^m8) high, and flat, with some bushes and pandanus on it. Bogtongan islets, 28 and 25 feet (8^m5 and 7^m6) high, and wooded, lie on the north-eastern side of the reef. Anchorage may be obtained off the edge of the reef except on the eastern side, in depths of from 10 to 20 fathoms (18^m3 to 36^m6).

Current.—*See* page 9.

Charts 3819, 3807.

CALAMIAN GROUP.—The Calamian (Kalamian) group of islands include Busuanga, Coron (Koron), Culion (Kulion) and numerous islets situated south-westward of Mindoro. The larger islands are generally hilly and indented, their summits are covered with grass, and the lower slopes and valleys are wooded. There is little cultivation; cattle is the principal export.

The climate of these islands is in general hot and unhealthy; intermittent fevers and cutaneous diseases prevail, attributable in all probability to excessive moisture and the bad quality of the drinking water.

The depths northward and eastward of the Calamian group are very irregular, with patches of from 7 to 10 fathoms (12^m8 to 18^m3) rising steeply from greater depths; a good look-out should be kept for shoals when navigating in this locality.

Chart 3819.

Busuanga. — North-eastern side. — Coast. — Anchorages. — Busuanga is the northernmost of the large islands of the group. Mount Tundalara, near the south-eastern end, is 2,140 feet (652^m3) high, and is the summit of the island; it is frequently covered by clouds, but when visible is a good mark.

Inagtapan point, 2 miles east-south-eastward of Macachin point, the northern extremity of the island, is the termination of a ridge separating two valleys, extending south-westward across the island to

Chart 3819.

the west coast. About 2 miles southward of Inagtapan point is the entrance to Calauit bay with Calauit (Kalauit) village on its western shore. Ditipac (Ditipak) river flows into the head of the bay, and also into Illultuk bay on the west coast.

Anchorage may be obtained by vessels with local knowledge off Minuit, about 7½ miles south-eastward of Inagtapan point, partially protected by some islets, from 120 to 212 feet ($36^{m}6$ to $64^{m}6$) high, about 1½ miles eastward of Minuit.

Port Caltom (Kaltom), the entrance to which lies about 6 miles south-eastward of Minuit, affords a sheltered anchorage for vessels with local knowledge. A long narrow coral reef extends about 4 cables from the head of the port towards the middle of the entrance, with a deep passage on either side.

The best anchorage in the vicinity is just inside the mouth of the Pangauaran river, close south-westward of the entrance to Port Caltom. Vessels with local knowledge may anchor here, in depths of from 10 to 12 fathoms ($18^{m}3$ to $21^{m}9$), mud.

Between the entrance to Port Caltom and Coconongon (Kokonongon) point (*Lat. 12° 14′ N., Long. 120° 13′ E.*), about 7 miles north-eastward, there is a bay, in the middle of which, extending north-westward from its south-eastern corner, is Cabilauan (Kabilauan) island, 715 feet ($217^{m}9$) high. On the south-western side of Cabilauan island, from north-west to south-east, are the following islands:—Dicapadiac, 179 feet ($54^{m}6$) high, Dimalanta, 292 feet ($89^{m}0$), Lauit, 313 feet ($95^{m}4$), Liatui, 244 feet ($74^{m}4$), and Hadyibulac, 211 feet ($64^{m}3$). There are several sunken reefs between Cabilauan island and the coast of Busuanga.

Chart 3807.

Off-lying islands and rocks.—Northwest rock, 125 feet ($38^{m}1$) high, with a flat summit, barren, and of dark appearance, lies 4¾ miles northward of Macachin point.

Chart 3819.

Dimipac (Dimipak) island, 439 feet ($133^{m}8$) high, and wooded, lies 1¾ miles northward of Macachin point; it is fringed by a reef over the greater part, extending about half a cable offshore. Sail rocks, a group of bare rocks, 109 feet ($33^{m}2$) high, lie about three-quarters of a mile northward of Dimipac island. A bank, with a depth of 45 feet ($13^{m}7$) over it, lies about 1½ miles north-eastward of Sail rocks.

Tanobon island, 263 feet ($80^{m}2$) high, and wooded, lying 2 miles north-eastward of Inagtapan point, is fringed by a reef. A bank, on which there are some rocks, 22 feet ($6^{m}7$) high, extends three-quarters of a mile north-eastward from the island. Two rocks, 4 feet ($1^{m}2$) high, lie about one mile west-north-westward of the south-western extremity of the island. The depths in this vicinity are irregular.

Diboyoyan island, 191 feet ($58^{m}2$) high, and fringed by a reef, lies about 7½ miles west-north-westward of Coconongon point. Dimaquiat (Dimakiat) island, 251 feet ($76^{m}5$) high, and Malpagalen island, 102 feet ($31^{m}1$) high, 8 cables south-eastward, lie on a steep-to bank, with depths of less than 10 fathoms ($18^{m}3$) over it, about 1¾ miles southward of Diboyoyan island. Dimaquiat and Malpagalen islands are connected by a ridge of coral and sand, with a depth of 23 feet ($7^{m}0$) over it. A 23-foot ($7^{m}0$) patch lies about 1¼ miles west-north-westward of Dimaquiat island, and a 7-fathom ($12^{m}8$) patch lies about 2 miles north-

Charts 3807, 967, 943, 2661b, 1263.

Chart 3819.

westward of the same island. There are several shoals between this island and the coast of Busuanga.

A bank, on which there is a rock, 5 feet ($1^{m}5$) high, lies about one mile north-westward of Coconongon point (*Lat. 12° 14′ N., Long. 120° 13′ E.*).

The islands north-eastward of Coconongon point are described with Apo West pass on page 46.

Coast.—Mount Coconongon, close south-westward of Coconongon point, is 841 feet ($256^{m}3$) high, conical and wooded. Mount Minangas, 1,838 feet ($560^{m}2$) high, is the northernmost and highest of three peaks fairly close together, about 9 miles south-south-eastward of Coconongon point, and about 1½ miles from the north-east coast; it is the first to be seen when approaching Busuanga from eastward.

An island, 253 feet ($77^{m}1$) high, lies on the outer end of a reef extending about one mile northward from the point lying about 2 miles south-eastward of Coconongon point.

Minangas bay.—**Dangers.**—Minangas bay, entered about 5½ miles south-south-eastward of Coconongon point, is the best protected anchorage on the north-eastern side of Busuanga. From a distance the entrance can be identified by several long reddish-brown scars, where small landslips have occurred on the eastern end of Napuscud island, on the northern side of the entrance.

Napuscud (Napuskud) island, 829 feet ($252^{m}7$) high, is connected by a reef with Depagal island, 658 feet ($200^{m}5$) high, close northward of it, the channel between which and Busuanga is foul.

A shoal, with a depth of 2 fathoms ($3^{m}7$) over it, lies about one mile north-north-eastward of the eastern extremity of Napuscud island.

A 1¼-fathom ($2^{m}3$) patch lies in the middle of the bay, about half a mile westward of the southern entrance point, and a shoal, with a depth of 1½ feet ($0^{m}5$) over it, lies a quarter of a mile southward of the south-western extremity of Napuscud island; both may be avoided by keeping 1½ cables from the northern shore, and both shoals are easily distinguished in a favourable light.

The southern shore of the bay is fringed by coral reefs which extend about three cables offshore in places.

Vessels with local knowledge may obtain a well-sheltered anchorage, in a depth of about 15 fathoms ($27^{m}4$), mud, midway between the south-western part of Napuscud island and Busuanga.

Charts 3401, Approaches to Koron bay, 3819.

Coast.—**Dangers.**—Between Minangas bay and Alonon point, 6½ miles south-eastward, there is a succession of high cliffy points and low mangrove bights fringed with coral reefs; several islands and rocks lie on the coastal reef. Lungaon, a large village, on the northern shore of a bay entered about 1½ miles northward of Alonon point, is the headquarters of a large fishing fleet.

A ridge, with a least depth of 12 feet ($3^{m}7$) over it, lies about 1¼ miles offshore, about 2 miles north-north-eastward of Alonon point. A shoal, with a depth of 10 feet ($3^{m}0$) over it, lies half a mile eastward of the same point.

Port Borac (Borak), entered about one mile south-south-westward of Alonon point, is available only for boats.

Dinaran island, 248 feet ($75^{m}6$) high, and wooded, except at its summit, lies about 1¼ miles south-eastward of Alonon point. The

Charts 3807, 967, 943, 2661b, 1263.

Charts 3401, Approaches to Koron bay, 3819.

western side of the island is steep-to, but the eastern and northern sides are fringed by a reef which extends nearly three-quarters of a mile north-north-eastward.

Mataya reef, which partly dries, is an extensive reef of coral and sand lying eastward and southward of Dinaran island, with a narrow but deep passage between; there are, however, some sunken dangers at the southern end of this passage and it is not recommended. Mataya island, 43 feet ($13^{m}1$) high, lies near the south-eastern edge of the reef, about 1½ miles south-eastward of the southern point of Dinaran island. A bank, with depths of less than 6 fathoms ($11^{m}0$) over it, extends about one mile northward from the northern extremity of the reef, leaving a narrow passage between its northern end and the southern extremity of the ridge north-north-eastward of Alonon point.

A shoal, with a depth of 9 feet ($2^{m}7$) over it, lies about 1¼ miles south-south-eastward of Mataya island and there are two shoals, with depths of 24 and 25 feet ($7^{m}3$ and $7^{m}6$) over them, situated about 1¼ miles south-south-eastward and southward, respectively, of the southern extremity of Mataya reef.

Chart 3401, Approaches to Koron bay.

Bocao (Bokao) point (*Lat. 12° 00′ N., Long. 120° 20′ E.*), 116 feet ($35^{m}4$) high, lies about 4 miles southward of Alonon point. A reef, on which there are two rocky islets, 45 and 50 feet ($13^{m}7$ and $15^{m}2$) high, respectively, extends 3 cables south-eastward from the point.

Southern side of Busuanga.—Off-lying islands and dangers.—The southern side of Busuanga between Bocao point and the eastern entrance to Coron passage, about 2 miles west-south-westward, is fringed by foul ground extending about half a mile offshore. A spit, on which there are two rocks, 54 and 59 feet ($16^{m}5$ and $18^{m}0$) high, respectively, extends about half a mile south-eastward from the point at the northern side of the eastern entrance of Coron passage. A 27-foot ($8^{m}2$) patch lies 4 cables south-south-westward of Bocao point.

Dibatuc (Dibatuk) island, 435 feet ($132^{m}6$) high, lies about 1¾ miles south-westward of Bocao point; it is covered with bushes and is uninhabited.

Coron (Koron) island, 2,010 feet ($612^{m}6$) high near the middle of the western side, is separated from the southern side of Busuanga by Coron passage. The eastern side of the island is indented by several coves, but they do not afford any protected anchorages. Close outside the middle of the entrance to the northernmost cove are two islets, 154 and 96 feet ($46^{m}9$ and $29^{m}3$) high, respectively. Both this cove and that entered about 3 miles southward, are mostly filled by a reef, which, in the latter cove, dries. The two southern coves, entered, respectively, about 2½ miles and one mile northward of Calis (Kalis) point, the southern extremity of Coron island, are fronted by foul ground. Calis point is 645 feet ($196^{m}6$) high, and precipitous.

Delian island, 790 feet ($240^{m}8$) high, lies 3 miles east-north-eastward of Calis point. The eastern side of the island is rocky and indented; a spit, with depths of less than 3 fathoms ($5^{m}5$) over it, extends 4 cables north-eastward and 3 cables southward from the island; an islet, 126 feet ($38^{m}4$) high, lies on the outer edge of the spit extending from the southern extremity of the island, and an islet, 134 feet ($40^{m}8$) high, lies close southward of the north-eastern extremity.

A shoal, with a depth of 22 feet ($6^{m}7$) over it, lies about 1¼ miles

Charts 3819, 3807, 967, 943, 2661b, 1263.

Chart 3401, Approaches to Koron bay.

east-north-eastward of the north-eastern extremity of Delian island. A shoal, with a depth of 10 feet (3^{m}0) over it, lies 4 miles north-north-eastward of the same island, and a 33-foot (10^{m}1) patch (chart 3819) lies about 1¾ miles farther in the same direction. A bank, on which there are depths of from less than 6 feet (1^{m}8) to 9 fathoms (16^{m}5), extends from the eastern side of Coron island, at about 4½ miles northward of Calis point, north-eastward to within half a mile of Dibatuc island.

Coron passage.—Dangers.—Coron (Koron) passage has a least width of half a mile between Limaa point, the northern extremity of Coron island, and Roja point, northward of it. A shoal, with a depth of 2 fathoms (3^{m}7) over it, lies in the fairway, about 8 cables eastward of Limaa point. A reef, which dries, extends from 1½ to 4¾ cables from the northern shore of the passage, and several sunken dangers lie about 6 cables off the same shore.

Between Limaa point, which is steep-to, and Coron (Koron) point, on the northern side of the passage, about 1¼ miles westward, are the Maquinit (Makinit) islands, 93 feet (28^{m}3) high, which are joined to the northern shore about 2½ cables north-north-eastward of Coron point by a reef. East Maquinit (Makinit) island, 176 feet (53^{m}6) high, lies in the fairway about half a mile south-westward of Limaa point; it is steep-to and may be passed on either side.

The north-western side of Coron island between Limaa point (*Lat. 11° 59′ N., Long. 120° 15′ E.*) and Balolo point, about 3¾ miles south-westward, is steep and indented and there are no dangers more than a quarter of a mile offshore, except for a coral reef, with a depth of 13 feet (4^{m}0) over it, about 6 cables south-westward of East Maquinit island. A rock, 73 feet (22^{m}3) high, lies on a shoal about 1¼ cables off the Coron coast and 2¼ miles south-westward of Limaa point. A reef extends 1¼ cables northward from Balolo point.

A reef, awash, lies 6 cables south-westward of Coron point, and on the southern side of the entrance to Coron (Koron) harbour. A narrow reef awash extends about 4 cables south-south-eastward from the south-eastern point of Uson island, which lies about one mile northward of Balolo point. About midway between the outer end of this reef and the reef awash south-westward of Coron point is a shoal, with a depth of less than 6 feet (1^{m}8) over it.

Uson island, 670 feet (204^{m}2) high at its south-western end, is undulating, and of the same general appearance as Busuanga. Several islets lie on the reef which fringes the island, the largest of which is Cabilauan (Kabilauan), close off the north-eastern side. Cagbatan (Kagbatan), 80 feet (24^{m}4) high, and Dimanglet island, 290 feet (88^{m}4) high, lie about 3 and 4 cables, respectively, off the southern side of Uson island.

Coron harbour.—Dangers.—Beacons.—Coron harbour is formed between the north-eastern side of Uson island and the coast of Busuanga north-westward of Coron point. A bank, with depths of less than one fathom (1^{m}8) over it, extends about 4 cables from the north-eastern shore, and there is foul ground on the south-western side extending from Cabilauan island, leaving a narrow channel leading into the harbour, marked on each side by beacons.

Coron (Koron), the principal town in Busuanga, stands about 1½ miles north-westward of Coron point. There is a stone pier available only

Charts 3819, 3807, 967, 943, 2661b, 1263.

Chart 3401, Approaches to Koron bay.

for boats at high water, and there is another pier, with a depth of 21 feet (6^{m}4) at its head, where there is a berth, 80 feet (24^{m}4) long, about half a mile south-eastward of the stone pier.

Anchorages.—Directions.—Anchorage may be obtained by vessels with local knowledge, in depths of from 10 to 12 fathoms (18^{m}3 to 21^{m}9), 3 cables southward of the south-eastern pier at Coron, or a better protected anchorage may be found westward of the town about midway between Canitauan (Kanitauan) island, about 8 cables west-north-westward of the stone pier, and Uson island, in depths of from 6 to 7 fathoms (11^{m}0 to 12^{m}8), mud. The channel leading to the latter anchorage is not marked, but the shoals may be easily distinguished.

Charts 3401, Approaches to Koron bay, 3819.

A vessel approaching Coron passage from eastward should pass about 2½ miles eastward and southward of Mataya island, and then steer to pass close northward or southward of Dibatuc island, thence keep close to the north-eastern side of Coron island, and round Limaa point at a distance of three-quarters of a cable; thence she should steer to pass about the same distance north-westward of East Maquinit island (*Lat. 11° 59′ N., Long. 120° 14′ E.*).

Coron passage is only available to vessels with local knowledge.

Chart 3401, Approaches to Koron bay.

If bound through Coron passage the vessel should steer to pass about one cable south-eastward of the end of the reef extending south-south-eastward from the south-eastern extremity of Uson island, and thence the same distance north-westward of the reef extending from Balolo point. If bound for Coron, after passing East Maquinit island, and when Coron point bears 000°, she should steer 314°, which will lead to the outer anchorage south-eastward of the town.

Radio station.—There is a radio station at Coron. *See* page 14.

Port Uson.—Dangers.—Port Uson, between Uson island and Busuanga, affords several good typhoon anchorages. The eastern entrance leading from Coron harbour between Uson island and the south-eastern end of Baquit (Bakit) island, is clear of dangers, with a least depth of 4 fathoms (7^{m}3) in the fairway, which is about 1½ cables wide. The best approach from westward is between the western end of Uson island and Mayanpayan island, about 4 cables westward, thence southward of Pinas island, 162 feet (49^{m}4) high, situated about half a mile east-north-eastward of the north-western extremity of Uson island; the channel between Pinas island and Uson island is about one cable wide, with a least depth of 9 fathoms (16^{m}5) in the fairway. A reef, awash, lies in the approach to the western entrance, about 6 cables southward of the south-western extremity of Uson island, and a 7-foot (2^{m}1) patch lies about one mile south-westward of the same point.

The best anchorage in Port Uson is in a depth of 8 or 9 fathoms (14^{m}6 or 16^{m}5), mud, between Uson and Baquit islands. Anchorage may also be obtained northward of Pinas island in the approach to Malbato bay, in the north-western part of the port; the head of this bay, however, is shallow, and a rock, awash, lies about 1½ cables south-eastward of Dianglit islet, situated half a mile westward of Namu point, the north-western extremity of Baquit island.

Port Luyucan (Luyukan), an inlet extending north-westward from the western side of the western entrance to Port Uson, lies between the

Charts 3819, 3807, 967, 943, 2661b, 1263.

Chart 3401, Approaches to Koron bay.

north-eastern side of Apo island, situated about three-quarters of a mile westward of Uson, and Busuanga, and affords anchorage to small vessels with local knowledge.

Chart 3807.

Western side of Busuanga.—Coast.—Between the northern extremity of Busuanga and Detobet point, about 11 miles southward, the western coast of Busuanga is indented and fringed with reef. Illultuk bay, entered about 2½ miles southward of Elinibinid point, the north-western point of the island, affords good anchorage to vessels with local knowledge, in depths of from 6 to 7 fathoms ($11^{m}0$ to $12^{m}8$), about 1¼ miles from the entrance, eastward of a point on the southern shore. An islet, 121 feet ($36^{m}9$) high, lies northward of the southern entrance point, to which it is joined by a reef. Elet island, 288 feet ($87^{m}8$) high, and Kalampisauan island, 380 feet ($115^{m}8$) high, lie close offshore close southward of the entrance.

Buluang village is situated in a small bight about 5 miles northward of Detobet point. Small craft with local knowledge may obtain anchorage in a break in the coastal reef, abreast the village, but it is open westward.

Off-lying dangers.—Pinnacle rock (*Lat. 12° 20′ N., Long. 119° 51′ E.*), 43 feet ($13^{m}1$) high, lies 1¼ miles north-westward of Elinibinid point, and midway between the rock and the coast eastward is a shoal, with a depth of 3 fathoms ($5^{m}5$) over it. A bank, with depths of from 6 to 8 fathoms ($11^{m}0$ to $14^{m}6$) over it, lies about 1¼ miles south-westward of Pinnacle rock.

Lena shoal, with a depth of 4¼ fathoms ($7^{m}8$) over it, lies about 6 miles north-westward of Elinibinid point.

There are numerous shoals and banks, with depths of from about 5 to 10 fathoms ($9^{m}1$ to $18^{m}3$) over them, lying within a distance of about 20 miles north-westward and westward of the coast between Elinibinid point and Detobet point, the position of which can best be seen on the chart.

Gutob bay and approaches.—Gutob bay, entered between Detobet point and a point about 3 miles east-north-eastward, is encumbered with islands and shoals. Malajon (Malahon) island, 779 feet ($237^{m}4$) high, barren and steep-to, lies 2 miles westward of Detobet point. Talampulan island, 418 feet ($127^{m}4$) high, and fringed by a reef which extends half a mile northward, lies about one mile south-south-westward of Detobet point. An island, 327 feet ($99^{m}7$) high, lies 3½ cables southward of Talampulan island. In the entrance to the bay are Capare island, 550 feet ($167^{m}6$) high, with its northern extremity situated about 1¾ miles north-eastward of Detobet point, Manolebeng island, 204 feet ($62^{m}2$) high, half a mile eastward of the southern part of Capare island, Manolaba island, 149 feet ($45^{m}4$) high, close eastward of the northern part of the same island and connected to it by a reef. Bacbac island, 336 feet ($102^{m}4$) high, lies about 3 cables north-eastward of the northern extremity of Capare island.

The best entrance to Gutob bay for vessels with local knowledge is between Detobet point and the northern end of Talampulan island, keeping nearer the former to avoid the reef which extends north-westward from the northern end of the island, thence between the land northward of Detobet point and the western side of Capare island, which passage leads to the best anchorage in the bay, between Bacbac

Charts 967, 943, 2660b, 2661b, 1263.

Chart 3807.

island and the shore, westward of it, in depths of from 7 to 11 fathoms (12^{m}8 to 20^{m}1), well protected from all winds.

Charts 3819, 3807.

Coast.—Between the eastern entrance point of Gutob bay and the south-western point of Busuanga are the towns of Busuanga, Salvacion, and Concepcion, about 3½, 5, and 10½ miles, respectively, south-south-eastward of the head of Gutob bay. At Busuanga there is a stone pier on the bank of the Busuanga river about 4 cables from the entrance. There is a bar at the mouth of this river, over which boats have difficulty in crossing at low water. At Salvacion the roof of the school is noticeable from south-westward, and at Concepcion there is a church with a galvanised iron roof, which is prominent from seaward. Salvacion island (*Lat. 12° 08′ N., Long. 119° 55′ E.*), 155 feet (47^{m}2) high, lies half a mile offshore westward of the town of the same name. There are numerous reefs awash and other dangers between Capare island and the coast of Busuanga eastward.

Chart 3401, Approaches to Koron bay.

Off-lying islands and dangers.—West Nalaut island, the westernmost of the Calamian group, is 235 feet (71^{m}6) high, and lies 6½ miles south-westward of Detobet point; it is fringed by a coral reef; the eastern part of the island is a low wooded sand spit and the western part is rocky; the island is uninhabited. A shoal (chart 3807), with a depth of 27 feet (8^{m}2) over it, lies 1½ miles west-north-westward of West Nalaut island, and a shoal, with a depth of 28 feet (8^{m}5) over it, lies 3½ miles north-north-westward of the same island.

East Nalaut island, 114 feet (34^{m}7) high, has two peaks, and lies 2½ miles north-eastward of West Nalaut island.

Pamalican (Pamalikan) islands, the largest of which is 70 feet (21^{m}3) high to the top of the trees, lie about 2½ miles east-north-eastward of East Nalaut island; foul ground lies within 7 cables westward and northward of the largest island; a rock, 14 feet (4^{m}3) high, lies at the southern end of the foul ground 3½ cables northward of the island. A reef awash and a one-fathom (1^{m}8) patch lie about one mile eastward and east-south-eastward, respectively, of the largest island.

North cay and South cay, 66 and 70 feet (20^{m}1 and 21^{m}3) high, respectively, lie one mile and 1½ miles southward of the largest island of the Pamalican group; the two cays are connected by a reef with a depth of 4 feet (1^{m}2) over it.

Maltatayoc (Maltatayok) island, 220 feet (67^{m}1) high, lies 2 miles southward of the Pamalican islands; it is fringed by a reef, and a bank, with depths of from 3 to 6 fathoms (5^{m}5 to 11^{m}0) over it, extends 4½ cables north-westward from the western extremity of the island. Horse island, 245 feet (74^{m}7) high, lies 6½ cables eastward of Maltatayoc island; an island, 215 feet (65^{m}5) high, lies on the reef which fringes Horse island, about one cable northward; a reef, awash, lies about 4½ cables farther northward, and another reef, awash, lies about midway between Maltatayoc island and the northern extremity of Horse island. A bank, with a depth of 3 fathoms (5^{m}5) over its outer end, extends about one mile westward from the southern extremity of Horse island.

Galoc (Galok) island, 662 feet (201^{m}8) high, lies close off the north-western extremity of the island of Culion, and is fringed by a reef. The channel between the two islands is encumbered with reefs and is not recommended. A rock above water lies about 6 cables south-

Charts 967, 943, 2660b, 2661b, 1263.

Chart 3401, Approaches to Koron bay.

ward of the south-western extremity of the island. About half a mile northward of the northern part of Galoc island is Popototan island, 345 feet (105^{m}2) high. A ridge, with a depth of 22 feet (6^{m}7) at its outer end, extends 1½ miles south-westward from Popototan island, and on the inner part is a reef, which dries, with two islets, of which one is 130 feet (39^{m}6) high, and a rock, 10 feet (3^{m}0) high, near its outer end. The channel between Popototan and Galoc islands has a least width of about 2 cables between the reefs on either side, and a least depth of 31 feet (9^{m}4) in the fairway. Vessels with local knowledge may obtain a sheltered anchorage in this channel. Napula island (*Lat. 11° 59′ N., Long. 119° 53′ E.*), 180 feet (54^{m}9) high, and fringed by a reef, lies about 3 cables north-eastward of the eastern extremity of Galoc island, and is connected by the reef which dries which fringes the northern side of Culion island.

A chain of islands—including Mangenguey (Mangenguei), 171 feet (52^{m}1) high—South Malbinchilao, 295 feet (89^{m}9)—North Malbinchilao, 310 feet (94^{m}5)—Rat, 156 feet (47^{m}5)—Malcatop (Malkatop), 288 feet (87^{m}8)—East Malcatop (Malkatop), 128 feet (39^{m}0)—Calumbuyan (Kalumbuyan), 225 feet (68^{m}6)—Dicoyan (Dikoyan), 215 feet (65^{m}5); and Tantagon, 168 feet (51^{m}2)—extends about 5½ miles north-eastward from a position about three-quarters of a mile northward of Popototan island.

Lusong island, 345 feet (105^{m}2) high, lies on the northern side of the strait, 7½ cables north-eastward of Marily island, and Tangat island, 1,510 feet (460^{m}2) high, lies about 2¼ miles eastward of Lusong island. Malpandon islet, 90 feet (27^{m}4) high, lies on a spit extending about 1½ cables from the southern extremity of Lusong island. Santa Monica islet, 90 feet (27^{m}4) high, lies about one mile north-westward of the northern extremity of Lusong island.

Culion island.—Culion (Kulion) island lies south-westward of Busuanga, from which it is separated by a strait, in which are numerous islands and some dangers, with a deep channel through the strait with a least width of about half a mile at its western end. The island is reserved as a leper colony, and it is unlawful for any vessel to communicate with it without permission of the Chief of the Culion leper colony, Bureau of Health.

Northern side of Culion island.—Off-lying islands and danger.—The northern side of Culion is indented. The only detached danger near the fairway through the strait northward of the island leading into Coron bay is a reef, on which there are some rocks, 5 feet (1^{m}5) high, lying 6½ cables south-south-eastward of Rat island.

Pass islet, 110 feet (33^{m}5) high, lies 2 miles east-north-eastward of Napula island. About 6 cables eastward of Pass islet is Lajo (Laho) island, 660 feet (201^{m}2) high, with Darab and Dibu islets lying close eastward and 2¾ cables south-eastward, respectively, of it. Lamud island, 570 feet (173^{m}7) high, lies 1½ cables southward of Lajo island, to which it is connected by a reef. Manglet island, 298 feet (90^{m}8) high, lies 7½ cables east-south-eastward of Lajo island. Marily (Marili) island, 647 feet (197^{m}2) high near its northern extremity, lies about half a mile east-south-eastward of Lamud island. Between these islands and the coast of Culion are the islets of Mona, Nici (Niki), Kalo, Magpa, Ennanda, Demang, Bakbak, and Laput and Pachiri islands, the positions of which may best be seen on the chart.

Charts 3819, 3807, 967, 943, 2661b, 1263.

Chart 3401, Approaches to Koron bay.

Chindonan island, 615 feet ($187^{m}4$) high and wooded, lies about 1½ miles south-eastward of Marily island, and between them are Naglayan and Tending islands, 235 and 220 feet ($71^{m}6$ and $67^{m}1$) high, respectively. Cacayaren (Kakayaren) islet lies on the reef which fringes the northern side of Chindonan island, and Burgur (*Lat. 11° 55′ N., Long. 120° 03′ E.*) and Inlulucut (Inlulukut) islands lie off the southern side of the island.

Western side of Culion island.—Off-lying dangers.—The west coast of Culion island is steep and rocky; it is fringed with a coral reef extending 4 cables offshore in places to within one mile of the entrance to Halsey harbour, situated about 12 miles south-south-eastward of the north-western extremity of the island. A shoal, with a least depth of 25 feet ($7^{m}6$) over it, lies 9 cables offshore and three-quarters of a mile south-eastward of the southern extremity of Galoc island. Two 28-foot ($8^{m}5$) patches lie about 2 and 3 miles, respectively, southward of the north-western extremity of Culion island, and about one mile and 1½ miles offshore. A shoal, with a depth of 31 feet ($9^{m}4$) over it, lies about 5 miles south-eastward of the southern extremity of Galoc island and about one mile offshore. A bank, with a depth of 25 feet ($7^{m}6$) over its outer end, extends about three-quarters of a mile north-westward from a point about 4¾ miles north-north-westward of the northern entrance point of Halsey harbour.

Chart 3401, plan of Halsey harbour.

Saddle rock, 114 feet ($34^{m}7$) high, and fringed by a reef, lies on the western side of a bank about 2 miles westward of the northern entrance point of Halsey harbour. Two rocks, awash, lie on the eastern side of the bank about 4 and 5 cables, respectively, eastward of Saddle rock, and another rock about 1¼ cables southward. When seen from northward or southward, Saddle rock has the appearance of a saddle.

Halsey harbour.—Alava island, 434 feet ($132^{m}3$) high, lies in the entrance to Halsey harbour, about 2¼ miles south-eastward of Saddle rock; it is fringed by a reef, which, from its southern side, extends about 3 cables, with some rocks, 50 and 60 feet ($15^{m}2$ and $18^{m}3$) high, on it. A spit, with depths of less than 3 fathoms ($5^{m}5$) over it, extends the same distance north-eastward from the island.

The shores of the harbour are steep, and the depths are considerable. South channel, between Alava island and the main island eastward of it, is only one cable wide between the shoals on either side, which, however, are steep-to, and can be plainly seen in a favourable light; there is a least depth of 12 fathoms ($21^{m}9$) in the fairway of the channel.

Research channel, between the northern point of Alava island and the northern entrance point of the harbour, is three-quarters of a mile wide, but the navigable channel is reduced to half a mile by the shoals extending from either side.

At its head the harbour branches into North arm and East arm, with several islands between them, the principal of which from west to east are Gage, 296 feet ($90^{m}2$) high, Iguana, 99 feet ($30^{m}2$) high, Alligator, 247 feet ($75^{m}3$) high, and an island, 65 feet ($19^{m}8$) high, lying close northward of Iguana island. The northern and north-eastern parts of North arm and the whole of East arm are shallow.

Anchorage.—Directions.—Anchorage, protected from all winds, may be obtained anywhere in the middle of Halsey harbour, in depths

Chart 3401, plan of Halsey harbour.

of from 15 to 18 fathoms ($27^{m}4$ to $32^{m}9$), mud. Small vessels may enter North arm through the narrow channel between Gage and Iguana islands.

To enter by Research channel a vessel should keep the summit of Rhodes island (*Lat. 11° 45′ N., Long. 119° 57′ E.*), situated on the southern side of the harbour three-quarters of a mile north-eastward of Alava island, between the two peaks of Mount Maus, 1,380 feet ($420^{m}6$) high, situated 1½ miles eastward of the eastern extremity of Rhodes island, bearing 095°, which will lead through the middle of the channel; thence she should keep in mid-channel.

Charts 3401, Approaches to Koron bay, 3819.

Coast.—Dangers.—A bank, with a depth of 28 feet ($8^{m}5$) at its outer edge, extends about half a mile from the south-western side of Culion island, at about 1¾ miles from the south-western extremity of the island. A sunken rock lies about 1½ cables offshore about half a mile north-westward of the same point.

Linapacan strait.—Islets and dangers.—Linapacan (Linapakan) strait, between the southern end of the Calamian group and the group of islands off the northern end of Palawan, is about 3 miles wide between Dicabaito (Dikabaito) island, situated close off the southern extremity of Culion, and Dicapululan (Dikapululan) island, 375 feet ($114^{m}3$) high, south-westward of it. Dicabaito island is 750 feet ($228^{m}6$) high, and close off its south-eastern extremity is an islet, 172 feet ($52^{m}4$) high. The strait is deep and clear of dangers, and the tidal streams have a rate of 3 knots.

Between Dicabaito island and the southern extremity of Culion is Dicabaito (Dikabaito) channel, in which vessels may obtain anchorage, in depths of from 7 to 9 fathoms ($12^{m}8$ to $16^{m}5$).

Beacon rocks, 13 feet ($4^{m}0$) high, lie on the southern side of the strait, about 7 miles westward of the southern extremity of Dicabaito island. Pangaldauan island, 342 feet ($104^{m}2$) high, and Binalabag island, 495 feet ($150^{m}9$) high, lie about 3 miles westward and 1½ miles south-eastward, respectively, of Dicapululan island. A 16-foot ($4^{m}9$) patch lies about 1¼ miles westward of Pangaldauan island.

Titangcob (Titangkob) island, 250 feet ($76^{m}2$) high, and fringed by a reef on its northern side, lies about 4 cables westward of Binalabag island. For the islands and dangers farther south-westward, *see* page 61.

Chart 3401, Approaches to Koron bay.

Eastern side of Culion island.—The east coast of Culion island is steep, wooded and indented, and has numerous islands and dangers lying off it. Mount Oltaloro, 1,560 feet ($475^{m}5$) high, and the summit of the island, lies about 1½ miles north-westward of Gorda point, which is situated about 7 miles north-eastward of the southern extremity of the island. Mount Maus, about 2½ miles north-westward of Mount Oltaloro, is described above.

Islands and dangers off the south-eastern side of Culion island.—Dipalian island, 383 feet ($116^{m}7$) high at its north-western end, lies about 2 miles southward of Gorda point, and between the island and the coast of Culion island westward is Calipipit (Kalipipit) island, 272 feet ($82^{m}9$) high. Canipo (Kanipo) island, 525 feet ($160^{m}0$) high, lies 3¾ miles east-south-eastward of Dipalian island; it is fringed by a reef on its northern side, which extends about 6 cables offshore. Two

Charts 3819, 3807, 967, 943, 2661b, 1263.

Chart 3401, Approaches to Koron bay.

shoals, each with a depth of 9 feet ($2^{m}7$) over it, lie within 7 cables of the south-eastern side of Canipo island. Lapulapu reef, with a depth of 9 feet ($2^{m}7$) over it, and Tuna reef, with a depth of 19 feet ($5^{m}8$) over it, lie about 2¼ miles south-eastward and 7 miles east-south-eastward, respectively, of the southern extremity of Canipo island. A 31-foot ($9^{m}4$) patch lies about 2 miles north-eastward of Lapululu reef, with other shoals between them. A 6-fathom ($11^{m}0$) patch lies 2¾ miles eastward of the same reef.

Chart 3819.

Tres Reyes, a group of four small rocky, steep-to islets, the largest of which is 81 feet ($24^{m}7$) high, lie 4¼ miles southward of Canipo island (*Lat. 11° 40′ N., Long. 120° 07′ E.*). A bank, with a least depth of 5 fathoms ($9^{m}1$) over it, extends about 6 cables northward and eastward from the largest islet. Bache reef, with a depth of 15 feet ($4^{m}6$) over it, lies 6¼ miles east-south-eastward of Tres Reyes. A shoal, with a depth of 28 feet ($8^{m}5$) over it, lies about 4 miles north-eastward of Bache reef, and two 7-fathom ($12^{m}8$) patches lie about 5½ and 10 miles, respectively, farther east-north-eastward.

Chart 3401, Approaches to Koron bay.

Calumbagan (Kalumbagan) island, 500 feet ($152^{m}4$) high, with a cone-shaped peak of reddish appearance, lies about 2 miles north-eastward of Canipo island; it is fringed by a reef, which, from the southern side, extends about half a mile south-westward, with an islet lying on it.

Malaposo islets consist of a small group of rocks lying on the southern end of a reef, which dries, situated 3¼ miles east-north-eastward of Calumbagan island. The largest islet is 294 feet ($89^{m}6$) high, cone-shaped, and of reddish appearance, and is the most conspicuous object in the vicinity. Between the Malaposo islets and Canipo island there are numerous shoals, with depths of from 9 to 18 feet ($2^{m}7$ to $5^{m}5$) over them. A shoal, with a least depth of 6 fathoms ($11^{m}0$) over it, lies about 4 miles south-eastward of Malaposo islets.

Beta shoal, with a depth of 28 feet ($8^{m}5$) over it, lies 7½ miles eastward of Malaposo islets.

Coron bay.—Islands and dangers.—Coron (Koron) bay is formed between the islands of Culion, Coron and Busuanga, and is entered between Calis point (page 51) and Guintungauan island, about 3¼ miles south-westward. The eastern entrance through Coron passage has been described on page 52, and the western entrance, northward of Culion island, on page 56.

Guintungauan island, 240 feet ($73^{m}2$) high, is fringed by a reef, which dries, extending about half a mile westward. A bank, with a depth of 19 feet ($5^{m}8$) over its outer end, extends three-quarters of a mile eastward, and a bank, on which there are depths of less than 6 feet ($1^{m}8$), extends westward to Bulalacao (Bulalakao) island, about 1¼ miles westward. Numerous shoals, with depths of from 10 to 18 feet ($3^{m}0$ to $5^{m}5$) over them, lie between Malaposo islets and Guintungauan island, and between Malaposo islets and the southern side of Bulalacao island. A shoal, with a depth of 15 feet ($4^{m}6$) over it, lies 2¼ miles south-south-eastward of Guintungauan island; it is the easternmost of the dangers on the western side of the approach to the entrance to Coron bay.

Bulalacao island, 710 feet ($216^{m}4$) high and densely wooded, is fringed by a reef, on which several islets lie, including Malimpalen islets, 96 feet ($29^{m}3$) high, close off the southern extremity, Dicalubuan (Dikalubuan) islet, 150 feet ($45^{m}7$) high, on the western side, and Malaroroy (Malaroroi) islets, 90 and 80 feet ($27^{m}4$ and $24^{m}4$) high, close off Bulog point, the north-western extremity. Bayuan bay lies on the northern side of the island, and is entered between Bulog point and Mandalala point, about 2 miles eastward. There is a leper colony on the island. A shoal, with a rock awash on its southern side, lies one mile northward of Mandalala point.

A reef, which dries, extends 1¾ miles southward from the southern side of Bulalacao island, and on its outer end is Mininlay (Mininlai) island, 155 feet ($47^{m}2$) high. Tres Marias rocks (*Lat. 11° 44′ N., Long. 120° 07′ E.*), 99 feet ($30^{m}2$) high, lie about 1½ miles south-south-westward of Batabuan point, the south-western extremity of Bulalacao island. Ditaytayan (Ditaytayen) island, 318 feet ($96^{m}9$) high, and fringed by a reef, lies about 2¼ miles south-westward of Batabuan point.

Tampel pass lies between the north-western side of Bulalacao island, on the south-east, and Malcapuya (Malkapuya) island, 170 feet ($51^{m}8$) high, and Tampel island, 385 feet ($117^{m}3$) high, on the north-west; the pass, which has a least width of 8 cables between the reefs on either side, is deep in the fairway and clear of dangers.

Between Malcapuya island and the eastern side of Culion island south-westward are several islands and dangers. Guinlep island, 383 feet ($116^{m}7$) high, and Cheron islet, 130 feet ($39^{m}6$) high, lie 9 cables south-south-westward and 7 cables south-eastward, respectively, of Calitan (Kalitan) point, situated about 4½ miles north-north-eastward of Gorda point.

Tambon island, 620 feet ($189^{m}0$) high, and heavily wooded, lies close north-westward of Tampel island, to which it is connected by a reef. The island is fringed by a reef, which, on the northern side, dries and extends 5½ cables offshore. Bayaca (Bayaka) islet, 160 feet ($48^{m}8$) high, lies about half a mile eastward of the north-eastern extremity of Tambon island. Piedra Blanca, a rock, 15 feet ($4^{m}6$) high, and Animosa reef, awash, lie 6½ cables northward and one mile north-eastward, respectively, of Bayaca islet. Piedra Blanca, being white, is easily identified. A reef, which dries, lies about 1½ miles south-south-eastward of Animosa reef, with several shoals and a rock, with a depth of one foot ($0^{m}3$) over it, between.

Dibanca (Dibanka) islands and several reefs, some of which are awash, lie between Tambon island and the coast of Culion island.

Dunaun island, 455 feet ($138^{m}7$) high, and wooded, lies half a mile northward of Tambon island, and is connected to the coast of Culion island by a reef which dries.

The western side of Coron island is fringed by a narrow reef. Coron (Koron) reef, awash, lies 1½ miles offshore, about 6 miles north-westward of Calis point. There are several shoals, with depths of from 22 to 25 feet ($6^{m}7$ to $7^{m}6$) over them, lying within 6 miles north-westward of Coron reef, and shoals, with depths of from 13 to 31 feet ($4^{m}0$ to $9^{m}4$), lying within 2 miles northward of it, the positions of which may best be seen on the chart.

Approaches to Port Culion.—Dangers.—Beacon.—A rock, with a depth of 15 feet ($4^{m}6$) over it, lies about 4 cables northward of Dunaun island. A 16-foot ($4^{m}9$) patch lies about one mile northward of the same island, and two shoals, with depths of 22 and 28 feet ($6^{m}7$

Chart 3401, Approaches to Koron bay.

and $8^{m}5$) over them, lie about three-quarters of a mile and one mile, respectively, north-eastward of the patch.

A reef, which usually breaks, and is steep-to, lies about 1½ miles southward of the south-eastern extremity of Chindonan island (page 57), and is marked by a black and white beacon.

Port Culion.—Light.—Beacons.—Port Culion (Kulion) is a narrow inlet which affords good anchorage for small vessels. The eastern side is formed by Sebik island, 165 feet ($50^{m}3$) high. The edge of the reef on either side of the entrance is marked by a beacon. A mole, which dries alongside, lies on the reef on the western side of the port. Vessels with local knowledge with a draught not exceeding 10 feet ($3^{m}0$), usually proceed alongside the head of the pier, known as Culion landing, situated about a quarter of a mile north-westward of the western entrance point, but caution is necessary as the head of the pier lies on the edge of the coastal reef. Fresh water is laid on to the head of the pier. For restrictions as to landing, *see* page 56. The leper colony is situated on the western side of the entrance to the port.

A light (*Lat. 11° 54′ N., Long. 120° 01′ E.*) is exhibited, at an elevation of 115 feet ($35^{m}0$), from a pole on the north-western entrance point of Port Culion.

Good sheltered anchorage may be obtained in Port Culion, in a depth of about 9 fathoms ($16^{m}5$), but it is necessary to moor as the harbour is confined.

Radio station.—There is a radio station at Culion (Kulion), *see* page 14.

Directions for Coron bay.—A vessel entering Coron bay from southward should steer for Calis point, bearing 000°, until Tangat island (page 56) bears 315°, when she should steer for it on that bearing.

Chart 3820.

ISLANDS AND DANGERS NORTH-EASTWARD OF PALAWAN.—Linapacan (Linapakan) island is the largest of an extensive group of islands lying between the north-eastern end of Palawan and the Calamian group; it is hilly throughout, rising to an elevation of 1,086 feet ($331^{m}0$) in the south-eastern part. All the points are high, steep, and rocky, with mangrove or sand beaches in the bays between them. There are two bays on the northern side, both open north-westward, and one on the southern side, with several islets and rocks lying off some of the prominent points.

The eastern bay on the northern side of Linapacan island, called North bay, is divided into three bights by two projecting points. At the head of the western of these are the old Spanish fort and settlement of San Nicolas. Good anchorage may be obtained by small vessels with local knowledge, in depths of from 6 to 7 fathoms ($11^{m}0$ to $12^{m}8$), mud.

In the western bay on the northern side of the island, called North-west bay, good and well protected anchorage may be obtained by vessels with local knowledge in the easternmost of the two arms at the head of the bay, in depths of from 18 to 19 fathoms ($32^{m}9$ to $34^{m}7$) mud. When entering this arm care should be taken to avoid the rocks extending 3½ cables offshore half a mile south-eastward of a small islet on the eastern side of the entrance.

Charts 3807, 967, 943, 2661b, 2660b, 1263.

Chart 3820.

Vanguardia islet (*Lat. 11° 32′ N., Long. 119° 44′ E.*), 91 feet ($27^{m}7$) high, lies about 3 miles northward of the western entrance point of North-west bay, and Alerta rock, 70 feet ($21^{m}3$) high, about 1¾ miles south-eastward of Vanguardia islet. There are dangers between Alerta rock and the point separating North-west bay and North bay ; dangers also extend over half a mile northward of the western entrance point of North-west bay.

Calaylayan (Kalaylayan) bay, the entrance to which is on the western side of Linapacan island, about 1½ miles south-south-eastward of the north-western extremity of the island, affords well protected anchorage to small craft with local knowledge, in a depth of about 15 fathoms ($27^{m}4$), but the space is contracted by a wide coral reef extending from the coast at the head of the bay. Cagdanao island, 291 feet ($88^{m}7$), high, lies about 3 cables westward of the southern entrance point of the bay ; it is fringed by reefs except on its eastern side, which is steep-to ; there is a deep channel on the northern and eastern sides of the island.

A shoal, with a depth of 34 feet ($10^{m}4$) over it, lies one mile north-westward of Cagdanao island. An islet, 50 feet ($15^{m}2$) high, lies 6 cables south-westward of the same island, and a rock, 25 feet ($7^{m}6$) high, lies on the outer end of the reef extending about 3 cables northward from the islet.

Gintu island, 204 feet ($62^{m}2$) high, lies 1½ miles south-south-eastward of the islet, with an island, 168 feet ($51^{m}2$) high, between them ; a rock, 15 feet ($4^{m}6$) high, lies about 2 cables northward of Gintu island, and a rock, 50 feet ($15^{m}2$) high, lies one mile south-westward of the island. Two shoals, with depths of 40 and 28 feet ($12^{m}2$ and $8^{m}5$) over them, lie about 1¼ and 1½ miles, respectively, southward of Gintu island.

South bay, on the southern side of Linapacan island, affords well protected anchorage for vessels with local knowledge, in the north-eastern arm of the bay, where the depths are from 14 to 18 fathoms ($25^{m}6$ to $32^{m}9$), mud, in the outer part ; the inner part is foul.

Foul ground extends 8 cables westward from the eastern entrance point of South bay, and Goson reef, with a depth of 28 feet ($8^{m}5$) over it, lies about 1¼ miles south-westward of the same point.

In the eastern part of Linapacan island there are steep, wooded ridges close to the coast. A landslip, 1¾ miles north-north-eastward of Sidsid point, the south-eastern extremity of the island, is a prominent landmark. Several rocks, above and below water, lie off this coast ; the outer one, 101 feet ($30^{m}8$) high, lies one mile offshore and about 2 miles north-eastward of Sidsid point.

The village of San Miguel is situated at the north-eastern end of Linapacan island, and 6 cables eastward of it is Patoyo island with two peaks, 740 feet ($225^{m}5$) high, with a deep channel between and clear of dangers in the fairway. There are tide-rips about one mile eastward and three-quarters of a mile southward of Patoyo island. Anchorage may be obtained by vessels with local knowledge, during south-westerly winds, off San Miguel.

Charts 3819, 3820, 3807.

There are numerous islands and dangers, with deep channels between them, lying northward and eastward of Linapacan island. Dimanglet island, 375 feet ($114^{m}3$) high, lies 1½ miles northward of Bulawan point, the northern extremity of Linapacan island ; it may be identified by its

Charts 3807, 967, 943, 2661b, 2660b, 1263.

Charts 3819, 3820, 3807.

two peaks, separated by low ground, the higher peak consisting of red cliffs which show up well from westward. Escucha rock, 80 feet (24^{m}4) high, lies 7 cables northward of the western extremity of Dimanglet island, with a rock, awash, 4 cables north-westward of it. A spit, with a depth of 2¾ fathoms (5^{m}0) over it, extends north-westward and south-eastward from Escucha rock.

Inapupan island (*Lat. 11° 33′ N., Long. 119° 51′ E.*), 426 feet (129^{m}8) high, lies about 1½ miles eastward of Dimanglet island. Bolina island, 220 feet (67^{m}1) high, and Manlegad island, 255 feet (77^{m}7) high, lie about three-quarters of a mile north-eastward and eastward, respectively, of Inapupan island. Ariara island, 505 feet (153^{m}9) high, lies about 7 cables southward of Manlegad island. Gued islet, 65 feet (19^{m}8) high, lies 8½ cables south-westward of Ariara island. Dimancal island, 410 feet (125^{m}0) high, and Dimansig island, 245 feet (74^{m}7) high, lie about 6 cables and 1¼ miles, respectively, eastward of Manlegad island. Malbatan island, 370 feet (112^{m}8) high, lies about one mile south-eastward of Dimansig island. Debogso island, 185 feet (56^{m}4) high, lies about 1¾ miles north-north-eastward of Malbatan island. Torres reef, with a depth of 25 feet (7^{m}6) over it, lies about 2¼ miles east-north-eastward of Malbatan island. The islands and dangers farther northward are described on page 58.

Mayokok islet, 75 feet (22^{m}9) high, lies three-quarters of a mile north-eastward of Patoyo island. Hidong islets, a group from 2 to 25 feet (0^{m}6 to 7^{m}6) high, lie about 1½ miles eastward of Patoyo island. Bacang (Bakang) bank, with a depth of 8 fathoms (14^{m}6) over it, lies about one mile eastward of Hidong islets. Sabino reef, with a depth of 28 feet (8^{m}5) over it, lies 4½ miles eastward of Hidong islets. Alipio reef, with a depth of 25 feet (7^{m}6) over it, lies about 3¾ miles farther eastward, and Basco reef, with a depth of 4 fathoms (7^{m}3) over it, lies about 1¼ miles north-eastward of Alipio reef.

Chart 3820.

Malubutglubut island, 2 miles north-westward of the western extremity of Linapacan island, is 685 feet (208^{m}8) high, and from the northward appears conical; the island is partly wooded and partly covered with tall grass. The channel between the two islands is deep except for a 9-fathom (16^{m}5) patch with probably a less depth, lying about 4 cables eastward of the southern extremity of Malubutglubut island. A strong current, depending on the rate and direction of the wind, will usually be found setting through the above-mentioned channel.

Base rock, about 2½ miles north-north-westward of Malubutglubut island, is 12 feet (3^{m}7) high, and between them are two rocks, 20 and 15 feet (6^{m}1 and 4^{m}6) high, respectively. Within 2 miles south-westward of Malubutglubut island, lying on a reef close to one another, are Nanga island, 490 feet (149^{m}3) high, Cacayatan (Kakayatan) island, 500 feet (152^{m}4), Lauanan island, 156 feet (47^{m}5), and Condut island, 205 feet (62^{m}5). A bank, on which there are two islets, 45 and 55 feet (13^{m}7 and 16^{m}8) high, extends about 3½ cables south-eastward from Condut island. Debogso rock, 165 feet (50^{m}3) high, lies 8½ cables south-westward of the northern extremity of Cacayatan island.

Barselisa island (*Lat. 11° 27′ N., Long. 119° 39′ E.*), 205 feet (62^{m}5) high, and fringed by a reef, lies 1¼ miles south-westward of Condut island. A rock, awash, lies about one mile south-south-eastward of Barselisa island.

Charts 3807, 967, 943, 2660b, 1263.

Chart 3820.

Calibang (Kalibang) island, 650 feet ($198^{m}1$) high, lies about one mile south-south-westward of Barselisa island. Emilia bay lies on the northern side of the island. There are several shoals, with depths of from 15 to 40 feet ($4^{m}6$ to $12^{m}2$) over them, lying between Calibang island and Linapacan island, and a rock, awash, lies 1¼ miles south-eastward of the south-eastern extremity of Calibang island.

For islands and dangers farther southward, *see* page 79.

Outlying islands and dangers eastward of Linapacan island.—Cabulauan (Kabulauan) island, 775 feet ($236^{m}2$) high, is the south-westernmost of a group of islands, lying about 14½ miles eastward of Sidsid point, Linapacan island. The northern side of the island is foul. Two rocks, the larger of which is 25 feet ($7^{m}6$) high, lie about 1¼ miles southward of Cabulauan island, and a 22-foot ($6^{m}7$) patch lies about 3 miles south-south-eastward of the island. A 27-foot ($8^{m}2$) patch lies 1¾ miles eastward of the island.

Nanga island, 390 feet ($118^{m}9$) high, lies about 2¼ miles north-eastward of Cabulauan island. Nangalao island, 760 feet ($231^{m}6$) high, lies about 2 miles north-eastward of Nanga island. Magranting island, 585 feet ($178^{m}3$) high, lies half a mile south-eastward of the southern end of Nangalao island, and is connected to it by a reef which dries. Tubug island, 300 feet ($91^{m}4$) high, is joined at low water to the south-western extremity of Nangalao island.

A shoal, with a depth of 28 feet ($8^{m}5$) over it, lies 9 cables north-westward of the northern part of Nangalao island, and Loreto reef, with a depth of 21 feet ($6^{m}4$) over it, lies 1¾ miles northward of the island. A 25-foot ($7^{m}6$) patch lies 11 miles eastward of Magranting island (*Lat. 11° 26′ N., Long. 120° 10′ E.*).

Salimbubuc (Salimbubuk) island, 100 feet ($30^{m}5$) high, lies 8¼ miles south-eastward of Cabulauan island. A bank, with depths of from 6 to 10 fathoms ($11^{m}0$ to $18^{m}3$) over it, extends about 1½ miles northward from Salimbubuc island. Canaron (Kanaron) island, 335 feet ($102^{m}1$) high, lies 4 miles south-south-eastward of Salimbubuc island. Foul ground, with rocks, from 25 to 130 feet ($7^{m}6$ to $39^{m}6$) high, on it, extends three-quarters of a mile northward from Canaron island, and a rock, 15 feet ($4^{m}6$) high, lies half a mile south-eastward of the island. Solitario rock, 25 feet ($7^{m}6$) high, lies nearly 5 miles north-eastward of Canaron island, and Patterson reef, with a depth of 7 feet ($2^{m}1$) over it, lies about 8½ miles westward of the same island.

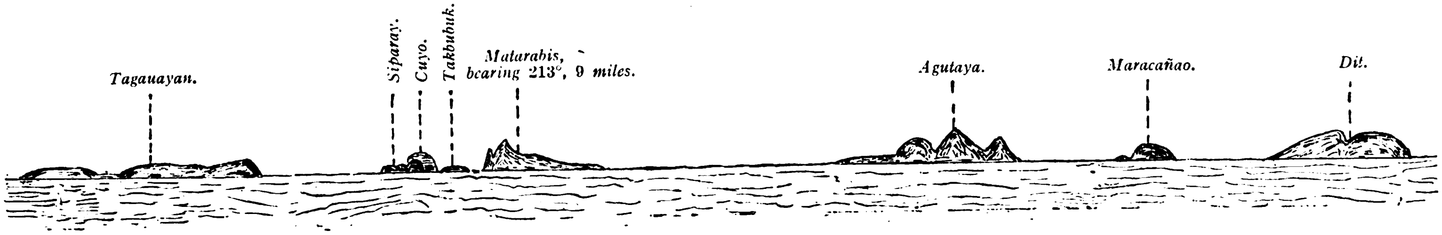
Charts 3820, 3821.

CUYO ISLANDS.—This group lies on the eastern part of a bank on which the Calamian group and Palawan are situated, from about 40 to 80 miles south-eastward of the former. The depths are fairly uniform, gradually increasing from 30 to 100 fathoms ($54^{m}9$ to $182^{m}9$) eastward of the Cuyo islands. The route eastward of the islands is generally used during the North-east monsoon from Basilan strait to Mindoro strait, thus taking advantage of the north-going current along the western side of Panay. All the islands, except Quiminatin (Kiminatin) (page 69), are of volcanic formation. (*See* view facing this page.)

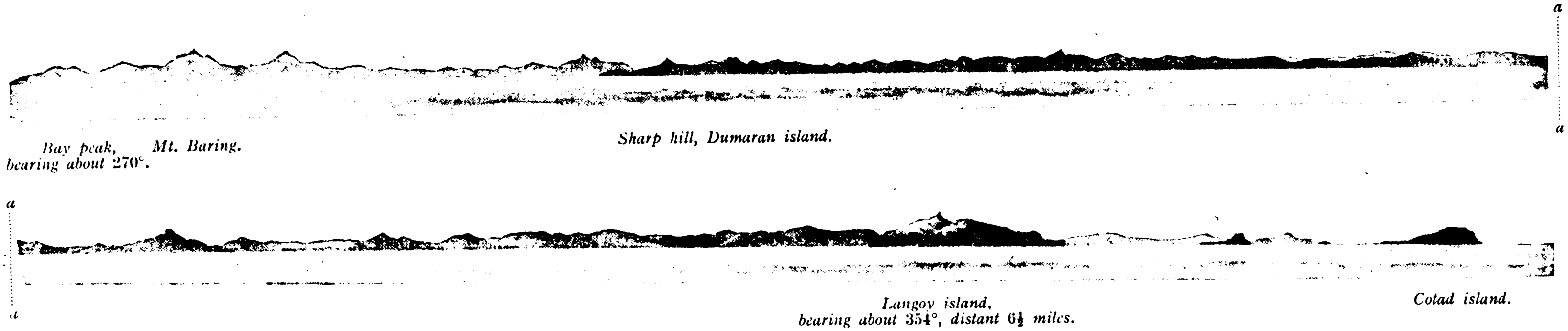
The channel between the north-east coast of Palawan and the Cuyo islands is called Cuyo West Pass, and that between the Cuyo islands and Panay is called Cuyo East Pass.

Charts 3807, 3809, 943, 1263.

To face page 64.



Cuyo islands, from north-eastward.
(Original dated 1922.)



View, in two parts, of Dumaran island, from south-eastward.
(Original dated 1850.)

Chart 3820.

Quiniluban group.—The Quiniluban (Kiniluban) group, the northernmost of the Cuyo islands, consists of several islands and rocks lying on a circular reef which is flat and sandy with numerous coral heads, some of which dry. The islands have a few trees, are covered with tall grass, and are sparsely inhabited. Quiniluban (Kiniluban) island (*Lat. 11° 26′ N., Long. 120° 50′ E.*), the largest of the group and 1,010 feet (307^{m}8) high, lies near the north-eastern edge of the reef; from northward it appears as a sharp cone, and from eastward as the middle of a ridge of reddish-brown colour.

Anchorage, partially protected from the sea during the North-east monsoon, may be obtained by vessels with local knowledge on the south-western side close to the edge of the reef.

Other islands of the group are Alcisiras (Alkisiras), 510 feet (155^{m}4) high, 6 cables south-westward of Quiniluban island; Tinituan, 480 feet (146^{m}3) high, on the western side of the group; Silad, 335 feet (102^{m}1) high, and Maligun, 515 feet (157^{m}0) high, both on the northern side; and Mandit, 183 feet (55^{m}8) high, 6½ cables south-south-eastward of Alcisiras.

Islands and dangers in northern part of Cuyo group.—Halog islands are two small islands, the north-eastern of which is 80 feet (24^{m}4) high, lying on a reef about 3 miles south-south-eastward of Quiniluban island. The channel between the reefs on which Quiniluban group and the Halog islands lie is 2 miles wide and free from danger, though there are several banks in it with depths of from 6 to 9 fathoms (11^{m}0 to 16^{m}5).

A shoal, with a depth of 21 feet (6^{m}4) over it, lies about 6½ miles east-south-eastward of Halog islands, and a reef, with a depth of 16 feet (4^{m}9) over it, lies about 5 miles south-westward of the same islands; this reef is steep-to on its western side.

Pamalican (Pamalikan) island, 7 miles south-westward of Quiniluban island, is 83 feet (25^{m}3) high, covered with bushes, and uninhabited; it is fringed by a reef, which dries, extending about one mile from its north-eastern side.

Manamoc (Manamok) island, 720 feet (219^{m}5) high, and uninhabited, lies about 2¾ miles south-westward of Pamalican island; it is fringed by a reef, which partially dries, extending from 2 to 9 cables offshore. There is a lagoon, with a depth of 3 feet (0^{m}9), in the south-western part of the island, into which native boats can enter. There is no regular communication between any of these islands.

Lean island, 223 feet (68^{m}0) high, and Imaruan island, 430 feet (131^{m}1) high, lie about 4¾ miles southward and 5¾ miles south-eastward, respectively, of Manamoc island. Oco (Oko) island, 320 feet (97^{m}5) high, with a rock, 90 feet (27^{m}4) high, close off its eastern side, lies 5½ miles east-north-eastward of Inaruan island. Dit island, 820 feet (249^{m}9) high, lies about 4 miles eastward of Oco island; there is a sandy beach on the western side of the island and one on the southern side. The western side of the island should be given a good berth as a bank, with depths of less than 5 fathoms (9^{m}1) over it, extends about 8 cables offshore. Gosong rocks, 15 feet (4^{m}6) high, lie about 2 miles south-westward of Dit island.

Chart 3821.

Maracanao (Marakanao) island (*Lat. 11° 14′ N., Long. 121° 04′ E.*), 431 feet (131^{m}4) high, lies on a bank, with depths of less than 10 fathoms (18^{m}3) over it, about 7 miles eastward of Dit island.

Charts 3807, 3809, 943, 1263.

Chart 3821.

Chinaman shoals are two shoals, with depths of 19 and 24 feet ($5^{m}8$ and $7^{m}3$) over them, lying about 3½ and 6 miles, respectively, north-north-eastward of Maracanao island.

Luzon bank, with a depth of 8 fathoms ($14^{m}6$) over it, lies about 10½ miles eastward of Maracanao island. Between Chinaman shoals and Luzon bank there are several banks, with depths of from 7 to 9 fathoms ($12^{m}8$ to $16^{m}5$) over them. Sultan bank, 28 miles north-eastward of Maracanao island, and other banks farther eastward, are described on page 334.

Islands and dangers in southern part of Cuyo group.—Agutaya island, about 4½ miles south-south-eastward of Dit island, is 885 feet ($269^{m}7$) high at its north-eastern end; the south-western end is lower and slopes gradually to the beach. There are three villages on the island. The island is fringed on its north-western and south-eastern sides by a reef which dries.

In 1886, H.M.S. *Flying Fish* anchored off the south-western end of Agutaya island, in a depth of 14 fathoms ($25^{m}6$), with the western extremity of Agutaya in line with the peak of Dit island.

A shoal, with a depth of 2 fathoms ($3^{m}7$) over it, lies 8 miles westward of Agutaya island.

Guinlabo islet, 195 feet ($59^{m}4$) high, lies near the eastern edge of a shoal, about 2½ miles southward of Agutaya island; it is steep-to on all sides except the north-west, where there is a rocky beach.

A rock, with a least known depth of 4 feet ($1^{m}2$) over it, lies about 3¾ miles westward of Guinlabo islet.

Matarabis island lies on the southern end of a bank, with depths of less than 10 fathoms ($18^{m}3$) over it, about 9½ miles eastward of Agutaya island, and can be easily identified by its steep conical hill, 364 feet ($110^{m}9$) high, which makes it the most conspicuous landmark in the Cuyo islands.

A shoal, with a least depth of 34 feet ($10^{m}4$) over it, lies about 3 miles west-north-westward of Matarabis island.

Siparay (Siparai) island, 260 feet ($79^{m}2$) high, and Tacbubuc (Takbubuk) island, 300 feet ($91^{m}4$) high, each lie on a bank, with depths of less than 10 fathoms ($18^{m}3$) over it, about 4¾ miles southward and 7½ miles south-south-westward, respectively, of Matarabis island.

Tagauayan islands are two islands, 556 and 435 feet ($169^{m}5$ and $132^{m}6$) high, respectively, connected by a rocky ledge, about 5½ miles south-eastward of Siparay island. Both islands are steep-to except in the bay between them, in which there is a ridge of shoals, with a least depth of 16 feet ($4^{m}9$) over it. This is the best anchorage in the Cuyo islands for vessels with local knowledge; during the South-west monsoon the wind draws through between the two islands with considerable force. Fair shelter from north-eastward can be obtained behind the peninsula which forms the northern side of the bay.

Cocoro (Kokoro) island (*Lat. 10° 53′ N., Long. 121° 12′ E.*), about 4 miles south-south-westward of the Tagauayan islands, is generally low, with a hill, 293 feet ($89^{m}3$) high, in the southern part. The island is fringed by a reef, except on its southern side, and a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends about 4 cables north-westward from its northern extremity. The island is inhabited and cultivated.

Charts 3809, 943, 1263.

Chart 3820.

Paya, Patunga, Pamitinan and Lubic (Lubik) islands, lying from 7 to 16 miles south-westward of Agutaya island, are hilly, and have no dangers outside a distance of half a mile from them. Kauayan island, 240 feet (73^{m}2) high, lies 14½ miles west-south-westward of Agutaya island. A shoal, with a depth of 46 feet (14^{m}0) over it, lies about 3½ miles north-westward of Kauayan island.

Tabac (Tabak) rock, 12 feet (3^{m}7) high, with a rock, awash, about a quarter of a mile north-eastward of it, lies 5½ miles west-north-westward of Lubic island. A rock, with a depth of 16 feet (4^{m}9) over it, lies 4½ miles south-westward of the same island.

A depth of 10 fathoms (18^{m}3) was reported, in 1939, in the fairway through Cuyo West pass about 9 miles west-north-westward of Tabac rock (*Lat. 11° 00′ N., Long. 120° 38′ E.*).

Round islet, 98 feet (29^{m}9) high, and the westernmost of the Cuyo islands, lies 11½ miles south-westward of Lubic island.

Canipo (Kanipo) island, 540 feet (164^{m}6) high, lies about 8 miles southward of Agutaya island. From all directions it appears as a ridge with regular slopes; it is covered with grass and brushwood. Vessels should keep well outside the 10-fathom (18^{m}3) line when approaching it.

Charts 3820, 3821.

Cuyo island.—Cuyo island, the largest and most important of the group, with a population of about 16,000, consists of two hills joined by a narrow neck of land. Mount Bombon, the northern hill, is 851 feet (259^{m}4) high. The shores in both of the bights southward of this hill consist of mangroves, while the coast at the northern extremity of the island is steep and rocky. Mount Aguada, 602 feet (183^{m}5) high, lies in the centre of the southern and larger part of the island; the coasts of this part are low rocky ledges, or consist of mangroves with coconut palms along the beaches. There are extensive coral reefs along the western coast and in the bight on the eastern side. Lucbuan (Lokbuan) hill, a sharp peak on the north-eastern side of the southern part of the island, rises to an elevation of about 360 feet (109^{m}7), and is a good landmark when approaching from eastward.

Putic (Putik) island, connected to the north-western point of Cuyo island by a reef, which nearly dries, rises to a sharp peak, 420 feet (128^{m}0) high. Indagamy (Indagami) islet, 130 feet (39^{m}6) high, rocky, and steep-to, lies about 1¼ miles westward of Putic island.

Chart 3820.

Gosong rock, 10 feet (3^{m}0) high, lies about one mile west-south-westward of Indagamy islet. Bararin island, 297 feet (90^{m}5) high, and steep-to on its western side, lies 4¼ miles west-north-westward of Cuyo pier (page 68).

Bisucay (Bisukai) island, 320 feet (97^{m}5) high, with a wooded summit, is separated from the western side of Cuyo island by Bisucay (Bisukai) channel, about 8 cables wide, but the navigable channel with a least depth of 6½ fathoms (11^{m}9), is only about 1¾ cables wide between the 3-fathom (5^{m}5) lines on either side. The north-eastern point of the island is low and sandy, and the south-eastern point is rocky with a hill, 90 feet (27^{m}4) high, on it.

In the area between Cuyo, Canipo, Bararin, and Bisucay islands are the Gosong dangers; the depths are irregular and generally less than 10 fathoms (18^{m}3), with patches of from 6 to 28 feet (1^{m}8 to

Chart 3820.

$8^{m}5$) over them in places. The northernmost of these patches, situated about 2¾ miles north-westward of Indagamy islet (*Lat. 10° 55′ N., Long. 121° 01′ E.*), has a depth of 13 feet ($4^{m}0$) over it. A 5-fathom ($9^{m}1$) patch lies 3 miles north-westward of Bararin island.

Pandan islet, 82 feet ($25^{m}0$) high, lies on the south-eastern part of a bank, about 4½ miles westward of Bisucay island. The bank, which has a depth of 39 feet ($11^{m}9$) at its outer end, extends 2 miles north-westward from the islet, and a spit, with a depth of 9 feet ($2^{m}7$) over it, extends about 3 cables northward.

Chart 3821.

Imalaguan island, 288 feet ($87^{m}8$) high, lies 3 miles southward of Balicao (Balikao) point, the south-eastern extremity of Cuyo island.

Chart 3820.

Cuyo.—Piers.—Light.—Buoys.—The town of Cuyo, situated on the north-western side of Cuyo island, is approached through a deep channel about three-quarters of a mile wide, northward of Bisucay island.

A black can buoy marks the northern side of the entrance to the anchorage, and a red conical buoy the southern side.

A stone pier, from the head of which a light is exhibited from a tower, at an elevation of 32 feet ($9^{m}8$), extends westward from the town. A pier, about 4¼ cables long, extends westward from Dabunan point, about 1½ miles southward of the stone pier.

Cuyo is connected to the general telegraph system.

Anchorages.—Directions.—Good anchorage for small vessels with local knowledge, protected from all winds except those from south-west, may be obtained in a break in the reef, in a depth of 5 fathoms ($9^{m}1$), 5½ cables from the head of the pier at Cuyo, with the light-tower bearing 085°. During the South-west monsoon vessels are sometimes obliged to seek shelter close to the northern side of Bisucay island, and during this period good protection may be obtained in the bay on the eastern side of Cuyo island, where landing may be effected.

A vessel bound for the anchorage off the town should approach with Mount Bombon, bearing 061°, which leads about half a mile north-westward of Balading point, the north-western extremity of Bisucay island, and about midway between the island and a 4½-fathom ($8^{m}2$) patch, the southernmost of the Gosong dangers, situated about 3 miles westward of the light-tower on the pier at Cuyo. When the light-tower bears 085° she should steer for it on that bearing. The depths between the anchorage and the pier decrease gradually.

On approaching the anchorage from the west or south-west, several iron roofs of some buildings will be seen in the northern part of the town; southward of these are the iron roof of the church and grey stone walls of the fort.

In 1886, H.M.S. *Flying Fish* anchored in a depth of 7 fathoms ($12^{m}8$), off Cuyo, with Mount Aguada bearing 102°, Mount Bombon 055°, and Silat islet seen between Bisucay and Cuyo islands.

Climatic table.—*See* page 28.

Islands and dangers south-westward of Cuyo island.—Silat islet (*Lat. 10° 42′ N., Long. 120° 58′ E.*), 118 feet ($36^{m}0$) high and wooded, lies 7 miles south-westward of Baayad point, the southern extremity of Cuyo island.

Capnoyan (Kapnoyan), Malcatop (Malkatop) and Pangatatan islands,

Charts 3809, 943, 1263.

Chart 3820.

lie on a bank, with depths of less than 10 fathoms ($18^{m}3$) over it, lying from about 7½ to 10 miles south-westward of Cuyo island. Capnoyan island, 468 feet ($142^{m}6$) high, is the only one inhabited. A narrow reef fringes the island except for a short stretch on the south-western side, where there is a steep rocky bluff. The eastern side of the island is steep-to, and a ridge, with depths of less than 6 fathoms ($11^{m}0$) over it, extends southward to Malcatop and Pangatatan islands ; there are numerous coral boulders in this area. A bank, with a depth of 32 feet ($9^{m}8$) near its outer end, extends about one mile north-westward from the island.

Malcatop island has two summits, the north-western of which is 127 feet ($38^{m}7$) high. Its coast is rocky, the north-western and southern sides rising in steep rocky bluffs. Pangatatan island, 127 feet ($38^{m}7$) high, has a sandy beach on its north-eastern side.

Pacheco shoal, with a depth of 21 feet ($6^{m}4$) over it, lies 2 miles south-westward of Pangatatan island, and Ramon shoal, with a depth of 15 feet ($4^{m}6$) over it, lies 4 miles westward of the same island.

Quiminatin (Kiminatin) island, about 6 miles westward of Capnoyan island, rises abruptly to an elevation of 580 feet ($176^{m}8$), and is almost inaccessible. The north-western corner is separated from the remainder of the island by a deep saddle, and the western side of this point is the only landing place for ascending to the summit.

Quiminatin (Kiminatin) Chico comprises two islets on the eastern edge of a bank situated about one mile west-south-westward of Quiminatin island, the larger one being 210 feet ($64^{m}0$) high ; the bank, which extends about one mile north-westward and three-quarters of a mile southward from the islets, has depths of from 9 to 37 feet ($2^{m}7$ to $11^{m}3$) over it, and is steep-to.

Santa Filomena shoals are three patches, with depths of 7, 8 and 12 feet ($2^{m}1$, $2^{m}4$ and $3^{m}7$) over them, with considerable depths between them, situated from 5½ to 6½ miles south-south-westward of Quiminatin island. These shoals are the outermost dangers of the Cuyo islands.

Outlying dangers.—Queen of the Sea bank, discovered in 1868 by Captain Smiley of the *Queen of the Sea*, is of considerable area, and has a least depth of 21 feet ($6^{m}4$) over it ; it lies about 26 miles south-westward of Quiminatin island. The southern and western sides are very steep, but on the northern and eastern sides soundings give ample warning of approach to the bank. It is rarely visible and seldom if ever breaks in heavy weather.

Charts 3820, 3821.

Piedra Blanca or White rock, 22 miles southward of the southern extremity of Cuyo island, is 10 feet ($3^{m}0$) high, and lies on the southern edge of a shoal which extends half a mile eastward and 1¼ miles north-westward from the rock, with depths of from 4 to 8 fathoms ($7^{m}3$ to $14^{m}6$). The shoal is steep-to, and there are depths of over 50 fathoms ($91^{m}4$) a short distance from the edge.

Chart 3821.

Sombrero rocks (*Lat. 10° 43′ N., Long. 121° 33′ E.*), about midway between the south-western end of Panay and Tagauayan, one of the Cuyo islands, shows as two black rocks of about the same elevation. It has been reported, however, that when approaching from northward it appears in two parts, of which the western, about 22 feet ($6^{m}7$) high, is the higher.

Charts 943, 1263.

Chart 3809.

ISLANDS AND DANGERS IN THE SULU SEA.—Cagayan islands.—Light.—The Cagayan (Kagayan) islands are situated in the southern part of an extensive reef which is very steep-to, the depth at the distance of one cable from the edge being over 100 fathoms ($182^{m}9$). The northern end of the reef lies 62 miles southward of Cuyo island. The islands consist mostly of low, even hills, the highest point, near the western side of Cagayan island, being only from 10 to 15 feet ($3^{m}0$ to $4^{m}6$) higher than the surrounding area; they are all wooded but partially cultivated.

Cagayan (Kagayan) island, the largest of the group, has a smooth ridge extending nearly its entire length, and a rocky bluff, from about 150 to 200 feet ($45^{m}7$ to $61^{m}0$) high, along its western coast, with a short stretch of sand beach near the middle. At the southern end of this beach is the only place on the western side of the island where an ascent to the top of the ridge is feasible. A coral reef, which dries in places, fringes the whole island. Cagayancillo (Kagayancillo), situated on the south-eastern side of the south-western end of the island, has a church and a school, and the ruins of an old fort lie on the bluff eastward of the village.

Tanusa and Volata islands are separated from the northern end of Cagayan island and from each other by narrow, foul channels, impassable except by small boats. Dauisan reef extends 8¼ miles northward from Tanusa, and on the western and northern sides of the reef there are rocky heads above water which mark it in the day time. Tanusa has the same general appearance as Cagayan, but Volata is rather flat.

Boombong island, the north-easternmost of the group, is about 50 feet ($15^{m}2$) high to the tops of the trees, and sandy.

Langisan and Anuling islands are bare rocks, the former 80 feet ($24^{m}4$) high, lying on the south-eastern edge of the reef on which the group is situated, and southward of Igcauayan reef.

Dondonay island, about 150 feet ($45^{m}7$) high, lies about half a mile south-westward of the Anuling islands; nearly the entire coastline is bluff and rocky with a few small stretches of beach. The island is mostly covered with scrub; the south-eastern side is fringed by a reef.

Calalong island, consisting of a group of low hills, with a steep rocky bluff on the southern side, is separated from the south-eastern side of Cagayan island by a narrow channel which dries. The channel between the eastern extremity of Calalong island and the south-western point of Dondonay island is encumbered with dangers. The best anchorage is southward of Calalong island, and is approached from the eastward, but it is only partly protected by the barrier reef, and should be used only by vessels with local knowledge.

Manucan (Manukan) island (*Lat. 9° 39′ N., Long. 121° 21′ E.*) lies on a detached coral reef, which dries, about 2 miles eastward of the Langisan islands; it is flat and sandy with some coconut trees on it.

A light is exhibited, at an elevation of 70 feet ($21^{m}3$), from a white steel framework tower, on Manucan island.

Dangers north-eastward of Cagayan islands.—Catimogan (Katimogan) shoals, consisting of several patches, with depths of from 2¼ to 8 fathoms ($4^{m}1$ to $14^{m}6$) over them, lie with their southern end about 2¾ miles north-eastward of Boombong island, and extend about 7 miles northward; there are considerable depths between the patches.

Charts 943, 1263.

Chart 3809.

Sultana shoals, over which there is a least depth of 5 feet (1^{m}5), lie with their southern end about 10 miles northward of Boombong island, and extend northward for about 5½ miles, with deep water between the patches. At the northern end there are several 1½-fathom (2^{m}7) patches.

Catimogan and Sultana shoals are very steep-to on their western sides, with depths of 100 fathoms (182^{m}9) at a distance of less than half a mile, but on the eastern side the bottom slopes more gradually.

Calusa island.—Calusa (Kalusa) island (*Lat. 9° 37′ N., Long. 121° 01′ E.*), sandy and covered with coconut trees, the tops of which are about 65 feet (19^{m}8) high, lies 10 miles west-north-westward of the south-western extremity of Cagayan island; it is fringed by a coral reef. There are several houses on the southern side of the island, but the island is not permanently inhabited.

The passage between Calusa and Cagayan is deep and free from dangers.

Charts 3809, 3811.

Cavili and Arena islands.—These coral islands, lying about 27 and 32 miles, respectively, south-westward of Cagayan island, are only about 5 feet (1^{m}5) high, but the tops of the trees are about 100 feet (30^{m}5) high on Cavili (Kavili) and 60 feet (18^{m}3) on Arena. On the reef on which the latter is situated are several detached sand cays southward and westward of the island. Both reefs are steep-to, and caution is necessary when navigating in their vicinity.

Tubbataha reefs.—Tubbataha reefs are two dangerous reefs separated by a deep channel about 4 miles wide, lying about 48 miles south-westward of Arena island. The north-eastern reef, which is steep-to, encloses a lagoon, in which there are depths of from 3 to 18 fathoms (5^{m}5 to 32^{m}9), mud, but there is no entrance into it through the reef.

North rock, Central rock, and several small black rocks are the only objects on the north-eastern reef that are above high water. At low water there are numerous sand cays or ridges, each about half a cable in length, which are visible along the entire length of the reef. North rock is covered with grass and some guano.

On the south-western reef, at its southern end, is South islet, about 5 feet (1^{m}5) high, and at the northern end there are several black rocks and sand cays above water.

Jessie Beazley reef.—Jessie Beazley reef, about 14 miles north-westward of North rock, has a bare coral head about 6 feet (1^{m}8) high, and dries over a considerable area.

Chart 967.

Mæander reef.—Mæander or Basterra reef, about 50 miles south-westward of South islet, was discovered by H.M.S. *Mæander* in 1849; it is a sand cay, 8 feet (2^{m}4) high, surrounded by a reef which is steep-to; it is frequented by numerous sea birds. A reef was reported, in 1945, to lie about 5 miles east-south-eastward of Mæander reef.

Bancoran island.—Bancoran (Bankoran) island (*Lat. 7° 57′ N., Long. 118° 40′ E.*), about 38 miles west-south-westward of Mæander reef, is densely wooded, the tops of the trees being about 100 feet (30^{m}5) high. Reefs extend about half a mile from the northern side and about 7 cables from the south-eastern side of the island; both the reefs and the island are steep-to.

Chart 943, 2660b, 1263.

Chart 967.

San Miguel islands.—Dangers and banks.—San Miguel (St. Michael) islands consist of four islets lying 13½ miles south-westward of Bancoran island. Bancauan (Bankauan), the largest of the group, rises to a peak, 123 feet (37^m5) high. At about 2 cables from the north-eastern point, the island is nearly divided by the sea. A small coral islet lies three-quarters of a mile northward of the island, and is connected to it by a reef which extends from the northern and western sides, with sand cays and large boulders on it. Bancauan islet is steep-to on its south-eastern side.

Manuc Manucan (Manuk Manukan), about 32 feet (9^m8) high to the tops of the trees, lies about 5 miles south-westward of Bancauan, and is sparsely wooded. A small coral islet, 20 feet (6^m1) high, lies half a mile southward of Manuc Manucan, and is connected to it by a reef. From this small islet the reef extends for about 1½ miles north-westward, with large lumps of coral showing at low water.

There is no safe anchorage round these islands. During the survey, anchorage was obtained, in a depth of 6 fathoms (11^m0), southward of Manuc Manucan (*Lat. 7° 43′ N., Long. 118° 27′ E.*).

Dangers and banks.—A reef, with a depth of 2¼ fathoms (4^m1) over it, lies 2¼ miles north-westward of Manuc Manucan, and is considered to be connected with it by shallow water.

A bank, with depths of from 14 to 20 fathoms (25^m6 to 36^m6) over it, was reported, in 1949, to lie from 7 to 13½ miles west-north-westward of Manuc Manucan.

Moyune shoal, with a least known depth of 3¼ fathoms (5^m9) over it, lies about 31 miles west-north-westward of Bancoran island; it was reported, in 1897, by S.S. *Moyune.*

Valparaiso shoal, which is reported to be about 2 miles in extent, with shoaler water south-westward of it, lies about 14 miles west-south-westward of Bancoran island. S.S. *Shantung*, drawing 19 feet (5^m8), reported, in 1910, having touched bottom in the vicinity of this shoal, the depth over which is assumed to be 3 fathoms (5^m5). The coral bottom has been clearly seen at a depth of 6 fathoms (11^m0).

Java reef, with a depth of 2½ fathoms (4^m6) over it, lies about 5 miles north-north-eastward of Bancauan island. It is marked by discoloration and there are strong tide-rips round it. A vessel proceeding towards the reef from westward should not open the small islet situated northward of Bancauan, westward of that island.

West bank, with a least depth of 6 fathoms (11^m0) at its southern end, lies about 4½ miles westward of Manuc Manucan.

South-west bank is an extensive bank, with a least depth of 9 fathoms (16^m5) over it, lying 6 miles south-westward of Manuc Manucan. The bottom is even, generally coral and sand, and may be clearly seen in a depth of 17 fathoms (31^m1). Anchorage with good holding ground may be obtained on the bank.

A small shoal, with an estimated depth of 2 or 3 fathoms (3^m7 or 5^m5) over it, was, in 1903, reported by U.S.S. *Juan de Austria* to lie about 16 miles west-south-westward of Manuc Manucan, and another shoal with a similar estimated depth, to lie about 4 miles farther south-westward.

A shoal covered with large boulders, some of which appear to be nearly awash, was also reported in 1903 by the same vessel to lie about 10 miles south-south-westward of Manuc Manucan. A sounding

Charts 2660b, 1263.

Chart 967.

of 4 fathoms ($7^{m}3$) was obtained on this shoal and one of 7 fathoms ($12^{m}8$) near its edge, which is steep-to.

A 7-fathom ($12^{m}8$) patch lies about 17 miles south-westward of Manuc Manucan.

Memnon shoal (*Lat. 7° 28′ N., Long. 118° 25′ E.*), about 15 miles southward of Manuc Manucan, consists of coral with patches of sand, with a least depth of 6 fathoms ($11^{m}0$) over it. Heavy tide-rips mark the north-eastern edge of the shoal, otherwise it does not show.

In 1891, H.M.S. *Egeria* observed the tidal stream over Memnon shoal to set between 204° and 329° at a maximum rate of 1¼ knots.

In 1937, H.M.S. *Dorsetshire* passed through a heavy breaking tide-rip, extending about 7 miles in a north-easterly and south-westerly direction, in a position about 16 miles east-south-eastward of Memnon shoal ; no bottom at 100 fathoms ($182^{m}9$) was, however, obtained near the southern edge of the tide-rip.

Chart 929.

Cagayan Sulu group.—Light.—Banks.—The Cagayan (Kagayan) Sulu group of islands is situated in the south-western part of the Sulu sea, about 100 miles eastward of the northern extremity of Borneo. It includes the island of Cagayan (Kagayan) Sulu, the two Muligi islands south-westward of it, and Keenapusan (Kinapusan), Pamelikan (Pomelikan), Bintut, Bohan, and Mandah (Mandan), northward of it. Cagayan Sulu is the only island inhabited.

Cagayan Sulu is, with the exception of the north-west and south-east points, which are steep-to, fringed by a coral reef extending in some places about three-quarters of a mile offshore ; this reef dries in patches, leaving channels for canoes between the edges of the reef and the coast of the island. In the interior of the island are ranges of hills attaining an elevation of 1,105 feet ($336^{m}8$) in Mount Ledan in the north-eastern part of the island, sloping gradually to the sea. (*See* view on chart 929.) The island is thinly populated ; the natives, who are indolent, export coconuts, oil, and mats.

Tanjong Banga, the north-eastern extremity of the island, is partially fringed by a narrow reef. Tanjong Tandotao is the south-eastern extremity of the island, and about 1¼ miles westward of it is the entrance to Gunboat harbour.

A light is exhibited from a white concrete tower, at an elevation of 387 feet ($118^{m}0$), close within Tanjong Tandotao.

Hurata, a small village on the south coast of the island, is situated on the eastern side of the entrance to Hurata (Hiwata) bay.

Keenapusan, the northernmost island of the group, lies 9 miles northward of Tanjong Tavotavo, the western extremity of Cagayan Sulu ; it is 311 feet ($94^{m}8$) high, and fringed by a reef, which, on the southern side, extends about 3 cables offshore.

North-east bank, with a least depth of 4 fathoms ($7^{m}3$) over it, lies about 3 miles north-eastward of Keenapusan. The western extremity of Bohan in line with Tanjong Tavotavo, bearing 202°, leads eastward of the bank, and Pamelikan, kept just open of Tanjong Tavotavo, bearing about 190°, leads westward of the bank.

North-west bank, with a least depth of 4 fathoms ($7^{m}3$) over it, lies with its south-eastern extremity about 3¼ miles north-westward of Keenapusan. It is of the same character as North-east bank, but is more steep-to and vessels should not anchor on it. The south-western

Charts 2576, 2660b, 1263.

Chart 929.

point of Pamelikan (*Lat. 7° 08′ N., Long. 118° 25′ E.*) in line with the south-western point of Bohan, bearing 162°, leads north-eastward of North-west bank, and the south-western point of Pamelikan in line with the south-western point of Mandah, bearing 144° leads south-westward of the bank.

A 7-fathom ($12^{m}8$) patch lies about 5 miles west-south-westward of Keenapusan island.

Chart 287.

A small bank, with a least depth of 18 fathoms ($32^{m}9$) over it, was reported, in 1945, about 7 miles northward of Keenapusan.

Chart 929.

Pamelikan, about 2¾ miles southward of Keenapusan, is 180 feet ($54^{m}9$) high, and fringed by a reef which extends about 3½ cables south-westward and eastward, with a large rock near the outer edge of the reef on the eastern side of the island.

Bintut, about 1¼ miles southward of Pamelikan, appears to be formed of dark sandstone. Bisu Bintut is a rock lying close eastward of Bintut. There is a deep channel between Bintut and Pamelikan and also between Bisu Bintut and Bisu Bohan, about three-quarters of a mile southward.

Bohan and Mandah (Mandan), situated about midway between Pamelikan and the northern side of Cagayan Sulu, are connected by a reef which dries; they are both densely wooded, and Mandah, the eastern one, has a sharp peak, 283 feet ($86^{m}3$) high. Mandah is steep-to, except where the reef connects it with Bohan. Bohan is fringed by a reef, which extends about half a mile from the western side, and terminates in Bisu Bohan, a rock, 66 feet ($20^{m}1$) high.

Lapunlapun, an islet 135 feet ($41^{m}1$) high, lies on the northern edge of a reef lying close off the middle of the northern side of Cagayan Sulu. Silumisan islet lies about 3 cables north-westward of Lapunlapun.

Muligi islands, 410 and 232 feet ($125^{m}0$ and $70^{m}7$) high, lie about 6 miles south-south-westward of Cagayan Sulu. A reef extends 2 cables north-eastward from the southern island. The channel between the two Muligi islands, though clear in the fairway, should not be attempted. These islands are uninhabited.

For shoals south-westward of Muligi islands, *see* page 129.

Willcox bank, reported, in 1877, by H.M.S. *Growler*, lies about 3¾ miles east-north-eastward of the northern end of the Muligi islands; it has a least depth of 2¾ fathoms ($5^{m}0$), coral, and the bottom is distinctly visible: the shoal is steep-to.

Anchorages.—The best anchorage during the North-east monsoon is at South-west anchorage, off the western side of Cagayan Sulu with Tanjong Tavotavo, bearing 350°, distant about 1¼ miles, in depths of from 9 to 11 fathoms ($16^{m}5$ to $20^{m}1$), sand and coral. During this monsoon a swell occasionally sets round Tanjong Tavotavo, interrupting communication with the island, the sea breaking along the entire edge of the reef.

Anchorage may also be obtained during the North-east monsoon off the southern side of Cagayan Sulu off the middle of the three remarkable crater lakes, in a depth of 10 fathoms ($18^{m}3$).

Anchorage may be obtained off the northern side of Cagayan Sulu, in a depth of 18 fathoms ($32^{m}9$), with Lapunlapun island bearing 058° and Tanjong Kamutayan (Kamutyajan), situated about 2½ miles east-

Chart 929.

north-eastward of Tanjong Tavotavo, 193°. Vessels should approach this anchorage with Tanjong Bulingis, situated 3¼ miles east-north-eastward of Tanjong Tavotavo, in line with the 800-foot (243^m8) hill on the eastern side of the island, bearing 111°.

Fair anchorage may be obtained off the south-western side of Keenapusan (*Lat. 7° 11′ N., Long. 118° 25′ E.*), in depths of from 7 to 10 fathoms (12^m8 to 18^m3), coral and sand, with the summit of the island bearing 041° and the summit of Pamelikan, 153°.

Fair anchorage may be obtained on either side of the edge of North-east bank.

Radio station.—There is a radio station on the southern side of Cagayan Sulu, close eastward of Lake Ernestine. *See* page 14.

Tidal streams.—The tidal streams amongst the Cagayan Sulu group are scarcely perceptible.

Charts 287, 967, 2576, 2660b, 1263.

CHAPTER III

EAST COAST OF PALAWAN

Chart 967.

PALAWAN.—General remarks.—The island of Palawan extends in a north-easterly and south-westerly direction between the parallels of 8° 20′ N. and 11° 25′ N., and forms the western boundary of the Sulu sea. The coast is deeply indented by numerous bays and inlets, some of which are the finest harbours in the Philippines. The island is sparsely inhabited and the interior little known.

Climate and weather.—*See* page 16.

Charts 3820, 967.

EASTERN SIDE OF PALAWAN.—There are numerous dangerous shoals and coral reefs lying as much as 20 miles off the east coast of Palawan; this coast should therefore be given a wide berth.

The adoption of the Palawan passage, in preference to the route on the eastern side of the island is recommended.

In giving sailing directions, and a description of the east coast of Palawan, it should be borne in mind that, although they may be found sufficiently succinct and accurate to meet the ordinary requirements of navigators, they are, nevertheless, not implicitly to be relied upon; nor are they intended in any way to lessen the necessity of keeping that vigilant look-out which the navigation of coral seas, on all occasions, constantly demands.

Tidal streams.—The flood stream sets southward along the coast and the ebb northward. The maximum rate observed was 1½ knots. The currents on the east coast depend chiefly on the prevailing winds. *See* preceding remarks.

Chart 3820.

Coast.—The northern end of Palawan is a wooded promontory, 5 miles in length, near the northern end of which, and on the eastern side, is North hill (*Lat. 11° 24′ N., Long. 119° 30′ E.*), 935 feet (285^{m}0) high, with rather a flat summit, and 1¼ miles westward of it is a hill, 965 feet (294^{m}1) high, both of which are prominent; southward of these hills is a ridge, rising to an elevation of 1,200 feet (365^{m}8). The coast of the promontory is bold, with only two small stretches of mangrove on the eastern side, the remainder being rock or steep sandy beaches fringed with coral.

Charts 943, 2660b, 1263.

Chart 3820.

Cabuli (Kabuli) island, 455 feet ($138^{m}7$) high, with rather a flat summit, and steep-to on all sides, lies a quarter of a mile northward of Cabuli point, situated about 1½ miles east-south-eastward of Libro point, the northern extremity of Palawan. Between Cabuli point and the island there is a depth of 34 feet ($10^{m}4$) in the fairway.

Brother islands are two small islands lying about half a mile apart with a deep channel between them and the Palawan coast, and also between the two islands ; the northern island, 110 feet ($33^{m}5$) high, lies three-quarters of a mile east-south-eastward of the south-eastern extremity of Cabuli point. A shoal, with a depth of 25 feet ($7^{m}6$) over it, lies three-quarters of a mile south-eastward of this island, and a shoal, with a depth of 22 feet ($6^{m}7$) over it, lies about 2 cables southward of the southern island.

Darocotan (Darokotan) bay, lies westward of Darocotan (Darokotan) point (*Lat. 11° 21′ N., Long. 119° 33′ E.*), situated about 5½ miles south-south-eastward of Cabuli point. In the northern approach to the bay, about 1¾ miles north-north-westward of Darocotan point, is Darocotan (Darokotan) island, 230 feet ($70^{m}1$) high. Good anchorage may be obtained by vessels with local knowledge during south-westerly winds, about midway between Darocotan island and the village of Tiniguiban, on the Palawan coast, about 1¼ miles west-south-westward, in a depth of 8 fathoms ($14^{m}6$), mud. This anchorage should be approached from northward, keeping half a mile from Darocotan island, where there is a least depth of 5 fathoms ($9^{m}1$). There is foul ground between Darocotan point and Darocotan island and in the southern part of the bay ; vessels should not bring Darocotan point to bear less than 090°.

Between Darocotan point and the western entrance to Shark Fin bay, 11 miles southward, the coast is fronted by numerous islands and reefs, and is fringed by a coral reef which extends more than one mile offshore in places. Two rocks, with depths of 7 and 10 feet ($2^{m}1$ and $3^{m}0$) over them, lie about 1¼ miles east-south-eastward and 2½ miles south-eastward, respectively, of Darocotan point ; a rock, awash, lies about 4 miles south-south-eastward of the same point and one mile offshore.

The village of Sibaltan stands 4½ miles southward of Darocatan point ; about 5 miles south-westward of the village is a mountain range attaining an elevation of 2,160 feet ($658^{m}4$), and 4 miles south-south-westward of this summit is Mount Ynantagung, 1,590 feet ($484^{m}6$) high.

Imorigue bay, entered between the northern extremity of Batas island, situated 9 miles south-south-eastward of Darocotan point, and the coast of Palawan westward of it, is encumbered with reefs and does not afford good anchorage. Malonao rock, 30 feet ($9^{m}1$) high, and steep-to, lies about 1¾ miles north-westward of the northern extremity of Batas island and the same distance from the coast of Palawan.

Off-lying islands and dangers.—Iloc (Ilok) island, lying 6½ miles east-south-eastward of Darocotan point, has two distinct ranges of hills, separated by a valley extending from the north-western to the south-eastern side. The island is thickly wooded, but in the southern part some land has been cleared and cultivated. The coast is fringed by coral reef except at the north-eastern end where it is underworn by

Charts 3809, 967, 943, 2660b, 1263.

Chart 3820.

the sea. A chain of rocks, from 2 to 18 feet ($0^{m}6$ to $5^{m}5$) high, extends half a mile from the northern end of the island. A rock, 78 feet ($23^{m}8$) high, lies on the edge of the fringing reef about 6 cables south-eastward of the northern extremity of the island, and a small islet, 185 feet ($56^{m}4$) high, on the edge of the coastal reef on the eastern side of the island, about one mile from the southern end, is well defined; about 6½ cables eastward of it is a shoal with a depth of 37 feet ($11^{m}3$) over it. Pinamalayan village stands near the southern extremity of Iloc island.

Barangonan island, three-quarters of a mile north-eastward of Iloc island, has a double-peaked hill, 385 feet ($117^{m}3$) high, in the south-western part, by which the island may be easily identified, these peaks being bare, whereas the other hills in this locality are wooded.

Dado rock, 1½ miles south-eastward of Barangonan island, rises vertically to an elevation of 75 feet ($22^{m}9$). A shoal, with a depth of 4 fathoms ($7^{m}3$) over it, extends about 2 cables from the north-western side of the rock. Dado bank, with a least depth of 8 fathoms ($14^{m}6$) over it, lies about one mile south-eastward of Dado rock.

Binulbulan island (*Lat. 11° 15′ N., Long. 119° 37′ E.*), 2 miles south-westward of Iloc island, is wooded and has three distinct peaks, the northern and highest having an elevation of 660 feet ($201^{m}2$). Shoals and detached sunken rocks extend about half a mile from the south-eastern end of the island. A rocky islet, 155 feet ($47^{m}2$) high, lies one mile south-south-eastward of the southern extremity of the island, with another islet, 100 feet ($30^{m}5$) high, midway between them.

Bagambangan island, 550 feet ($167^{m}6$) high, lies about 1¾ miles south-eastward of Iloc island; it is wooded except for a small area on the western side which is partly cultivated. A rock, 75 feet ($22^{m}9$) high, lies close off the north-eastern point of the island, and a rock, 80 feet ($24^{m}4$) high, lies on the fringing reef on the western side. Between Bagambangan island and the southern extremity of Iloc is Little Maosonon island, 139 feet ($42^{m}4$) high, about one mile south-south-westward of which is Maosonon island, 310 feet ($94^{m}4$) high. Cone rock, 152 feet ($46^{m}3$) high, with a reddish appearance, lies about three-quarters of a mile south-eastward of the southern extremity of Bagambangan island. A rock, 120 feet ($36^{m}6$) high on its eastern side, but low and sandy on its western side, lies 1½ miles south-south-westward of the southern extremity of Bagambangan island, and a rock, 10 feet ($3^{m}0$) high, lies 3¼ cables farther south-westward. A spit, with a depth of 22 feet ($6^{m}7$) near its outer end, extends three-quarters of a mile north-westward from the 120-foot ($36^{m}6$) rock. A 5-fathom ($9^{m}1$) patch lies 9 cables westward of the same rock.

Deribongan island, 328 feet ($100^{m}0$) high, and Cagdanao (Kagdanao) island, 326 feet ($99^{m}4$) high, lie about 2½ and 3¾ miles, respectively, southward of Bagambangan island. Maalequequen island, 296 feet ($90^{m}2$) high, lies about midway between Cagdanao island and the eastern side of Batas island. A 33-foot ($10^{m}1$) patch lies 1¼ miles north-north-westward of Maalequequen island.

Benito shoal, with a depth of 40 feet ($12^{m}2$) over it, lies about 8½ miles eastward of Barangonan island. Primo reef, with a depth of 10 feet ($3^{m}0$) over it, lies 7½ miles eastward of the north-eastern point of Bagambangan island. Ubaldo reef, with a depth of 16 feet ($4^{m}9$) over it, lies 5¾ miles south-eastward of the same point, and Bera bank,

Charts 287, 3809, 967, 2660b, 1263.

Chart 3820.

with a depth of 42 feet ($12^{m}8$) over it, lies about 5¾ miles eastward of Deribongan island. These dangers are all steep-to.

Shark Fin bay.—Shark Fin bay lies between Batas island on the north, Maytiguid island on the south, and the coast of Palawan on the west, and is about 2½ miles wide at its entrance. Nearly the entire shore line consists of mangrove, and is fringed with numerous reefs and shoals. The north-western part of the bay between the village of Oton, which stands at the head, and the south-western end of Batas island, forms the best typhoon anchorage in this part of Palawan.

Batas island has two densely wooded peaks, the western and higher of which has an elevation of 1,455 feet ($443^{m}5$); the island is nearly divided into two by the bays indenting the low land between these two peaks. The coast is bordered by a reef with numerous shoals and rocks above water lying off the northern, western and south-western parts of the island. Imorigue island, 1,062 feet ($323^{m}7$) high, lying westward of Batas island, is connected to it by a reef which dries.

Maytiguid island, 1,100 feet ($335^{m}3$) high in its southern part and wooded, is separated from the coast of Palawan by a channel which is less than one cable wide. The island is mostly fringed with mangroves and reefs, on which are several high rocks. A reef, with some islets on it, lies within about 1¼ miles from the northern side of the island.

Miraya islet, 125 feet ($38^{m}1$) high, and densely wooded, lies 1¼ miles off the south-eastern side of Batas island, and Macuao (Makuao) islet, 80 feet ($24^{m}4$) high, lies about 2 miles south-westward of Batas island, near the head of the bay. These two islets are excellent marks for approaching the anchorage.

A rock, with a depth of less than 6 feet ($1^{m}8$) over it, lies about 3 cables north-eastward of Miraya islet. A reef, awash, lies in the middle of the entrance to Shark Fin bay, about 1½ miles southward of Miraya islet, with a rock, with a depth of about 4 feet ($1^{m}2$) over it, about 3 cables north-westward of it.

Anchorage.—Directions.—Anchorage may be obtained by vessels with local knowledge, in a depth of about 9 fathoms ($16^{m}5$), mud, about 2 miles northward of Macuao islet (*Lat. 11° 07′ N., Long. 119° 32′ E.*), with the south-western extremity of Batas island bearing about 100°. Vessels approaching the bay from northward, should round the eastern end of Batas island in mid-channel between it and the islands eastward of it, and thence pass 5 cables north-westward of Miraya islet. Vessels from southward should pass between Maobanen and Maytiguid islands, thence between the islets and reefs off the northern end of Maytiguid island and the reef awash in the middle of the entrance to the bay. The track is indicated by a pecked line on the chart.

Off-lying islands and dangers.—Fronting the entrance to Shark Fin bay and extending southward with the parallel of the southern point of Maytiguid island are Pangisian, Calabugdong (Kalabugdong), Maobanen (Mayobanen), Cagdanao (Kagdanao), Casian (Kasian), Debangan and Dadaliten islands, and many islets and dangers, the positions of which can best be seen on the chart.

The passage between these islands and Maytiguid island is deep in the fairway and has a least width of about one mile between the dangers on either side, but the channels between the islands of the group are narrow and tortuous, and should not be attempted.

Charts 287, 3809, 967, 943, 2660b, 1263.

Chart 3820.

Pangisian island, 208 feet (63^m4) high, has cliffs rising vertically from the water at its north-eastern end, and a pinnacle rock, 150 feet (45^m7) high, is prominent. Two rocks, 41 and 75 feet (12^m5 and 22^m9) high, lie about 7 cables east-north-eastward and 9 cables south-eastward, respectively, of the south-western extremity of the island.

Calabugdong, the largest island of the group, is 692 feet (210^m9) high. A cliff, 400 feet (121^m9) high, halfway along the east coast, is noticeable from north-eastward. The western side of the island is fringed with mangrove, while the eastern and northern sides are rocky with occasional stretches of sandy beach. Maqueriben (Makairiben) island, 295 feet (89^m9) high, lies close off the north-eastern side of Calabugdong island. Malotamban islet, 168 feet (51^m2) high, lies about half a mile westward of the southern part of the same island.

Binga island, 385 feet (117^m3) high, lies about 3¼ miles eastward of the northern part of Calabugdong island, with a rock, 95 feet (29^m0) high, about one cable northward of it, and another, 30 feet (9^m1) high, about three-quarters of a cable south-eastward of it.

Maobanen island, 706 feet (215^m2) high, lies half a mile southward of Calabugdong island. Unlike the other islands of this group, Moabanen is not heavily wooded. A rocky islet, 91 feet (27^m7) high, rising vertically from the water, lies about 2¾ cables from the north-eastern end of the island, and on the north-eastern side of this islet is a prominent pinnacle rock, with rocks, which dry about 2 feet (0^m6), about half a cable north-eastward of it. A rock, awash, lies about one mile westward of the northern extremity of Maobanen island. Dinit island, 247 feet (75^m3) high, lies about half a mile south-south-westward of Maobanen island.

Casian island, 3 cables eastward of Maobanen island, has a sharp conical peak, 865 feet (263^m6) high, near the south-western end. The village of Casian is situated on the southern side of the island near the eastern end. Foul ground extends about 6 cables from the southern side of the island.

Debangan island, separated from the south-eastern end of Casian island by a narrow shallow channel, has a prominent peak, 703 feet (214^m3) high, and is wooded except for a narrow strip along the west coast, which is cultivated. About 1½ cables south-westward of Debangan are several rocks, from 2 to 15 feet (0^m6 to 4^m6) high, and a 7-foot (2^m1) patch lies about one mile westward of the southern extremity of the island; about 2¼ cables north-eastward of the island is a rock, 30 feet (9^m1) high, rising vertically from the water.

Cagdanao island, about 1¼ miles north-eastward of Casian island, has a sharp prominent peak, 533 feet (162^m5) high. Between Cagdanao and the large islands westward and southward of it there are numerous dangers.

Tejada (Tehada) reef, with a depth of 31 feet (9^m4) over it and steep-to, lies about 7 miles eastward of Binga island. Filemon bank, with a depth of 48 feet (14^m6) over it, lies about 4 miles north-eastward of Debangan island (*Lat. 11° 01′ N., Long. 119° 44′ E.*).

Dadaliten island, 257 feet (78^m3) high, lies near the western end of a shoal, 2 miles west-south-westward of Debangan island, and on the northern side of the channel, which is 1¼ miles wide, leading from north-eastward into Taytay bay. A bank, with depths of less

Charts 3809, 967, 943, 2660b, 1263.

Chart 3820.

than 3 fathoms (5^m^5) over it, extends half a mile southward and 1¼ miles eastward from Dadaliten island.

A coral reef, with a depth of one foot (0^m^3) over it, lies 2 miles south-westward of Dadaliten island.

Coast.—Silanga bay is formed by the south-western side of Maytiguid island and the coast of Palawan westward. Silanga village is situated on the western side of the bay, and about 1¾ miles north-westward of it is Silanga peak, 1,535 feet (467^m^9) high. The northern and eastern shores of the bay are foul, and the western shore is fringed by a wide coral reef. Anchorage may be obtained by vessels with local knowledge, in depths of from 10 to 12 fathoms (18^m^3 to 21^m^9), about three-quarters of a mile south-eastward of the village. During the North-east monsoon, tide-rips, dangerous to small boats, occasionally form off Nabat island, 226 feet (68^m^9) high, situated close southward of Negra point, the southern extremity of Maytiguid island.

Silanga islands, 175 feet (53^m^3) high, lie in the southern entrance to Silanga bay, about 2½ miles westward of Negra point.

Shark Fin peak, 1,819 feet (554^m^4) high, and situated about 6½ miles west-north-westward of Silanga village, is the most prominent peak at the northern end of Palawan; it is sharp and so inclined as to give it the appearance of a shark's fin. From the peak a ridge, from 1,700 to 1,900 feet (518^m^2 to 579^m^1) high, extends 3½ miles southward, ending in a sharp peak, known as Sharp Shoulder, 1,100 feet (335^m^3) high.

TAYTAY BAY AND APPROACHES.—Taytay bay lies with its entrance between Negra point and Santa Cruz point, about 10½ miles southward. A range of mountains, with several prominent peaks, from about 1,400 to 1,500 feet (426^m^7 to 457^m^2) high, extends parallel with the coast on the western side of the bay, about 2½ miles inland. The village of Polarican (Polarikan) is situated on the western shore of the bay, about 10 miles north-westward of Santa Cruz point. Except for about 1½ miles at the village of Taytay, in the south-western part of the bay, the entire shore line is fringed with mangroves. Foul ground extends over 2 miles from the western shore. At the northern extremity of the bay is Mesecoy (Mesekoi) bay which is encumbered with shoals.

North-eastern approach.—Islands and dangers.—Binatican (Binatikan) island, 570 feet (173^m^7) high, is the easternmost island in the approach to Taytay bay, being situated 3 miles south-south-westward of Debangan island. A chain of shoals, with a depth of 7 feet (2^m^1) at its northern end, and two heads, with a depth of less than 6 feet (1^m^8) over them, extend from a position about 4 miles eastward of the northern extremity of Binatican island, for 6¾ miles south-south-westward. A bank, with depths of less than 10 fathoms (18^m^3) over it, and with a least depth of 10 feet (3^m^0), extends about 3½ miles north-eastward from the eastern side of Binatican island; a 2-fathom (3^m^7) patch lies one mile southward of the island, and a rock, with a depth of less than 6 feet (1^m^8) over it, lies about 8 cables south-westward. Two shoals, with depths of 31 and 34 feet (9^m^4 and 10^m^4) over them, lie about one mile and 2¼ miles, respectively, westward of the northern extremity of the same island.

Apulit island (*Lat. 10° 58′ N., Long. 119° 37′ E.*), 585 feet (178^m^3) high, lies 5¼ miles westward of Binatican island; it slopes gradually

Charts 3809, 967, 943, 2660b, 1263.

Chart 3820.

northward, but the southern extremity is a high bluff. Royalist reef, with a least depth of 4 feet (1m2) over it, lies about half a mile eastward of Apulit island; between its eastern side and the reef with a depth of one foot (0m3) over it, about 1½ miles north-eastward, there is a deep channel clear of dangers, the track through which is shown by a pecked line on the chart, leading northward into Shark Fin bay.

A spit, with a depth of one foot (0m3) over it, extends three-quarters of a mile westward from the northern end of Apulit island. About three-quarters of a mile and 1¼ miles westward of the outer edge of this spit are a shoal, with a depth of 7 feet (2m1) over it, and a shoal, which dries, respectively. Ditnot islet, about 30 feet (9m1) high, lies 3½ miles westward of Apulit island, and 1¾ miles north-westward of the islet is Talacanen (Talakanen) island, lying about 2 miles from the western shore of Taytay bay.

Malatpuso rock, 77 feet (23m5) high, lies about 3½ miles south-south-westward of Binatican island, and on the western side of a bank, with depths of from 7 to 30 feet (2m1 to 9m1) over it, extending from about 2½ to 6 miles south-south-westward from Binatican island. A bank, on which there is a rock, with a depth of 4 feet (1m2) over it, lies about 1½ miles north-westward of Malatpuso rock.

Pabellon islands, consisting of Elephant island, 645 feet (196m6) high, the northern of the two, and Castle island, 620 feet (189m0) high, and resembling a castle, lie 3½ miles westward of Malatpuso rock. A bank, with a least depth of 4 feet (1m2) over it, extends about 1¼ miles from the eastern side of Elephant island, and a 10-foot (3m0) patch lies about 1½ miles eastward of Castle island. There are numerous shoals between Pabellon islands and the western shore of Taytay bay. Calabadian (Kalabadian) island, 550 feet (167m6) high, lies about one mile south-south-eastward of Castle island.

Eastern approach.—Islands and dangers.—Hart reef, with a least depth of 3 feet (0m9) over it, lies about 2½ miles southward of the northern extremity of a bank, with depths of less than 10 fathoms (18m3) over it, lying about 11 miles south-eastward of Malatpuso rock. Two shoals, with depths of 18 and 7 feet (5m5 and 2m1) over them, lie on the south-eastern side of the track, indicated by a pecked line on the chart, about 6½ miles east-south-eastward and 8 miles south-eastward, respectively, of Malatpuso rock.

Icadambanauan (Ikadambanauan) island, about one mile southward of Calabadian island, may be identified by its two hills, the southern of which is 512 feet (156m0) high. Two groups of black rocks, 4 feet (1m2) high, lie about one mile north-eastward and 1¼ miles eastward, respectively, of the eastern extremity of the island, and a white rock, about 50 feet (15m2) high, lies a quarter of a mile south-westward of a wooded islet, 300 feet (91m4) high, lying about 3 cables from the south-eastern side. Several dangerous shoals, the positions of which may best be seen on the chart, lie on either side of the track between the island and Hart reef (*Lat. 10° 48′ N., Long. 119° 51′ E.*).

In the area westward of a line joining Binga island (page 80) and the eastern extremity of Dumaran island, about 36 miles south-eastward, there are numerous dangerous coral shoals, the most important of which have been described above, but there are many others, the positions of which may best be seen on the chart. Caution is necessary when navigating this area, and a good look-out aloft is essential.

Charts 3809, 967, 943, 2660b, 1263.

Chart 3820.

Anchorage.—Directions.—A good anchorage may be obtained in Taytay bay by vessels with local knowledge, in a depth of 18 fathoms ($32^{m}9$), with Taytay head, situated about 5 miles west-north-westward of the northern extremity of Santa Cruz point, bearing 273°, and Taytay fort, situated 2 miles south-south-eastward of Taytay head, 211°.

Vessels with local knowledge may also obtain anchorage in Mesecoy bay, in depths of from 14 to 16 fathoms ($25^{m}6$ to $29^{m}3$), about half a mile southward or westward of Talacanen island.

The best approach to Taytay bay from north-eastward is between Binatican and Debangan islands, thence between Binatican and Apulit islands, thence north-westward of Elephant island, and thence to the anchorage off Taytay. If bound for Mesecoy bay, from a position half a mile southward of Nabat island, vessels are recommended to steer for the southern extremity of Talacanen island, bearing 266°, until Quimbaludan islet, situated about 3¾ miles westward of Nabat island, is abeam, thence to the anchorage.

Taytay.—Taytay is the largest settlement on this part of the Palawan coast. The old Spanish fort is prominent when approaching the anchorage off the village.

COAST.—Between Santa Cruz point and Esfuerzo point, about 20 miles south-south-eastward, the coast is much indented and fronted with islets and reefs. The mountains are wooded, the prominent points are rocky where the mountains come close to the coast, and the bays are generally bordered with mangroves.

Calauag (Kalauag) bay, entered between Limbangan point, 5½ miles southward of Santa Cruz point, and Pangkang point, 3¼ miles south-eastward of Limbangan point, is fronted by Ibobor island, 600 feet ($182^{m}9$) high, on the southern side of which there is a good, but narrow channel; the channel on the western side is closed by reefs. There are numerous dangers in the bay, and only vessels with local knowledge should attempt to enter it.

Off-lying islands and dangers.—Calabucay (Kalabukai) island, 150 feet ($45^{m}7$) high, and wooded, lies about 2 miles north-eastward of Ibobor island. A bank, with depths of less than 6 fathoms ($11^{m}0$) over it, extends about 2 miles north-eastward from the island; a ridge from this bank extends southward, passing about one mile eastward of the island to a position about 1½ miles southward, where there is a depth of 9 feet ($2^{m}7$). A shoal, with a least depth of 13 feet ($4^{m}0$) over its southern end, lies about half a mile westward of the island; a 12-foot ($3^{m}7$) patch lies about 1½ miles north-north-westward of the island. Cagdanao (Kagdanao) island, 250 feet ($76^{m}2$) high, lies about 1½ miles south-westward of Calabucay island. A reef, with a depth of one foot ($0^{m}3$) over it, and steep-to, lies about half a mile north-eastward of Cagdanao island. The channel recommended for vessels with local knowledge proceeding along the coast within the islands and off-lying dangers lies between this reef and Cagdanao island, and is indicated by a pecked line on the chart.

Paly (Pali) island (*Lat. 10° 42′ N., Long. 119° 41′ E.*), 610 feet ($185^{m}9$) high, lies 2½ miles south-eastward of Calabucay island. The outer slopes of the island are steep-to and only sparsely wooded; its coast is rocky, with stretches of sand, shingle, or boulders; and shoals, the positions of which may best be seen on the chart, lie northward,

Charts 3809, 967, 943, 2660b, 1263.

Chart 3820.

eastward, and southward of the island. There is a shoal, with a depth of 3 feet ($0^{m}9$) over it, about a quarter of a mile from the western side of the island, about 1¼ miles from the northern extremity; otherwise the western side is steep-to.

Dumaran island.—Dumaran island, separated from Esfuerzo point by Dumaran channel, is 675 feet ($205^{m}7$) high; it has no conspicuous features by which to distinguish it, the hills being mostly from 400 to 500 feet ($121^{m}9$ to $152^{m}4$) high, and densely wooded. Most of its coast is fringed with mangrove. Between the island and the coast of Palawan there are numerous dangers, with depths of from less than 6 feet ($1^{m}8$) over them to 30 feet ($9^{m}1$), the positions of which may best be seen on the chart. Several islands, the highest of which has an elevation of 322 feet ($98^{m}1$), lie in the northern approach to Dumaran channel (page 85), northward and westward of the western extremity of Dumaran island. *See* view facing page 64.

Northern and eastern sides of Dumaran island.—Dangers.—Light.—North point, the northern extremity, terminates in a white cliff and is prominent; it is steep-to on its northern and western sides and affords good protection against the North-east monsoon, but a reef, which dries, extends about three-quarters of a mile eastward from the point. Shoals, with depths of less than 6 fathoms ($11^{m}0$) over them, extend about 3 miles from the northern side of the island. Cacbucao (Kakbukao) islet, 115 feet ($35^{m}0$) high, with a barren rock, 22 feet ($6^{m}7$) high, about 1¼ miles west-south-westward of it, lies about 2½ miles northward of North point, and a shoal, with a depth of 16 feet ($4^{m}9$) over it, lies one mile north-north-eastward of the point.

Pirata head, 237 feet ($72^{m}2$) high, the eastern extremity of Dumaran island, is steep-to on its north-eastern side, but from its south-eastern side a reef, which dries, extends about 1¼ miles, with Maraquit (Marakit) island, 205 feet ($62^{m}5$) high, and wooded, at its extremity. Cotad (Kotad) island, 345 feet ($105^{m}2$) high, lies three-quarters of a mile south-eastward of Maraquit island, with a least depth of 25 feet ($7^{m}6$) in the channel between them. Mantulali island, 168 feet ($51^{m}2$) high, lies one mile south-westward of Cotad island, with a shoal, with a depth of 7 feet ($2^{m}1$) in mid-channel between them. Langoy (Langoi) island lies one mile south-south-westward of Mantulali island, with a deep channel between them. All these islands except Maraquit are steep-to on their seaward side, and have high dark cliffs. A rock, with a depth of less than 6 feet ($1^{m}8$) over it, and a 7-foot ($2^{m}1$) patch lie about 3 and 8 cables, respectively, north-westward of Langoy island.

A light (*Lat. 10° 30′ N., Long. 120° 00′ E.*) is exhibited, at an elevation of 364 feet ($110^{m}9$), from a white circular iron tower, on the summit of Langoy island.

Cambari (Kambari) island, about 230 feet ($70^{m}1$) high, lies about 5½ miles eastward of Pirata head. On the western side of the island there are some bare overhanging cliffs.

Southern side of Dumaran island.—Dangers.—Araceli bay is entered about one mile south-westward of Pirata head. Its shores are fringed by mangrove, and coral shoals, which dry, extend a considerable distance offshore; the town of Araceli, on Araceli point, the eastern entrance point, is nearly obscured by coconut trees; it is the only place where small boats can approach close to the shore at low water.

Araceli reef, with a depth of 1½ feet ($0^{m}5$) over it, lies half a mile

Charts 3809, 967, 943, 2660b, 1263.

Chart 3820.

eastward of Baliog point, the southern entrance point of Araceli bay. A reef, which dries, with large boulders always visible, extends about half a mile southward from the eastern part of the town, and forms a protection to the anchorage, which may be obtained by vessels with local knowledge, in depths of from 4 to 5 fathoms ($7^{m}3$ to $9^{m}1$), mud, about half a mile south-westward of Araceli point.

North-westward of the town there is a basin forming an excellent typhoon anchorage for small vessels, but the entrance is contracted and obstructed by shoals extending from both sides ; a depth of 2 fathoms ($3^{m}7$) may be carried through the channel by vessels with local knowledge.

Vessels are recommended to approach the anchorage between Langoy and Mantulali islands, and thence pass westward of Araceli reef.

Bacaran (Bakaran), Langcan (Langkan) and Calasag (Kalasag) bays are indentations in the southern side of Dumaran island, the entrances to which lie about 4½, 6 and 9, miles, respectively, south-westward of Pirata head. The shores of all three bays are bordered with mangrove with a few short stretches of sandy beach. Reefs extend a considerable distance offshore, and the heads of the bays are shallow. There are several settlements on the shores of the bays, Bohol, in Calasag bay, being the largest. In each bay vessels with local knowledge may obtain good anchorage, protected from the North-east monsoon, and in Langcan bay there is a good typhoon anchorage for small craft north-north-westward of Langcan point, situated on the eastern side, about 1½ miles north-westward of the north-eastern entrance point.

Several sunken dangers lie from about one to 3 miles off this coast, the positions of which can best be seen on the chart, and between Calasag point, the south-western entrance point of Calasag bay, and Piyaui point dangerous reefs lie from three-quarters of a mile off the former point, to 2 miles off the latter. Sharp hill, 525 feet ($160^{m}0$) high, lies close to the coast about 3 miles westward of Calasag point, and is a well defined mark for vessels approaching from southward. This stretch of coast is densely wooded, and is fringed with a coral reef extending a short distance offshore ; the points are high and rocky.

Dumaran channel.—Dumaran channel is 1½ miles wide between the western point of Dumaran island and Esfuerzo point. The navigable channel northward of Esfuerzo point is much contracted by islands and reefs, and southward of the point there are numerous dangerous shoals, so that only vessels with local knowledge should use it. Capayas (Kapayas) reef, which dries, lies about 1½ miles eastward of Capayas village, situated 5 miles south-westward of Esfuerzo point. The western side of Dumaran island is fringed with mangrove.

Dumaran bay lies on the eastern side of Dumaran channel, and is entered on the eastern side of Dumaran point, 4¼ miles northward of Piyaui point (*Lat. 10° 27′ N., Long. 119° 46′ E.*). Anchorage may be obtained in the bay by vessels with local knowledge, but it is difficult to approach unless the channel is well marked. The village of Dumaran is situated on the eastern side near the head of the bay ; it is connected by telephone with Araceli, at the eastern end of the island. For the islands and dangers farther northward, *see* page 84.

Dalanganem islands. — Dalanganem islands, situated about

Charts 3809, 967, 943, 2660b, 1263.

Chart 3820.

15 miles north-eastward of Dumaran island, consist of two islands and five islets rising abruptly from the sea.

Calandagan (Kalandagan) island, the southernmost of the group, rises steeply to a ridge, 704 feet ($214^{m}6$) high, but the main part of the island is 1,024 feet ($312^{m}1$) high, and is covered with grass and trees, with some scattered houses. The village of Tudela is situated on the neck of low land that joins the two parts of the island.

Anchorage may be obtained by vessels with local knowledge off the north-eastern side of Calandagan island, in fair weather, in depths of from 9 to 11 fathoms ($16^{m}5$ to $20^{m}1$), coral and sand, and in a depth of 4 or 5 fathoms ($7^{m}3$ or $9^{m}1$), on the shoal which extends three-quarters of a mile southward from the south-western side of the island.

An islet, 200 feet ($61^{m}0$) high, with a smaller one northward of it, lies on a reef extending about three-quarters of a mile northward from Calandagan island; the summit is wooded, but the ends of the islet are bare.

Maducang (Madukang) island, 965 feet ($294^{m}1$) high, lies about one mile north-north-eastward of Calandagan island, with a depth of 9 fathoms ($16^{m}5$) between them, where anchorage may be obtained with a little protection under the lee of either island. Anas (Indong) islet, 296 feet ($90^{m}2$) high, is connected to the south-eastern end of Maducang island by a reef which dries.

Casirahan (Kasirahan) islet, 5 miles eastward of the northern end of Calandagan island, is rocky, steep-to and 115 feet ($35^{m}0$) high; the north-eastern part, which is the higher, is covered with grass and bushes; the south-western part is barren.

Cauayan (Kauayan) or Bird islet, about 2 miles north-north-westward of Casirahan islet, is a bare rock rising almost vertically to a height of 97 feet ($29^{m}6$). The north-eastern side is less steep than the other side, and a landing may be effected there. A rock, nearly awash, lies about half a cable westward of the southern end of the islet.

Charts 3820, 3809.

Coast.—Dangers.—Flechas point lies about 12 miles south-westward of Esfuerzo point, and between them the coast is fronted by numerous shoals and reefs, with deep channels between them, which lie as much as 8 miles offshore. Densely wooded mountains with well-defined peaks approach close to Flechas point and its vicinity. The point is steep and high, being the termination of a spur from Mount Baring, 2½ miles north-north-westward. Drake peak, 1,260 feet ($384^{m}1$) high, 5¾ miles westward of Esfuerzo point; a peak, 1,010 feet ($307^{m}8$) high, about 2 miles southward of Drake peak, and Mount Ilian, 2,170 feet ($661^{m}4$) high, with a well-defined clump of trees on its summit, situated 4 miles north-north-westward of Flechas point (*Lat. 10° 22′ N., Long. 119° 35′ E.*), are good landmarks. The mountains in this vicinity are seldom obscured by clouds. Capayas is the only village along this coast.

Chart 3809.

Green Island bay.—Islands and dangers.—Between Flechas point and Bold point (chart 967), about 32 miles south-westward, there is a large open bight known as Green Island bay; in it are several islands, all low and flat, Green island and Johnson island, situated about 7½ miles south-south-westward and 13 miles south-westward of

Charts 967, 943, 2660b, 1263.

Chart 3809.

Flechas point, respectively, being the only ones which can be distinguished when passing along the coast. At a distance of 6 or 8 miles, only the tops of the trees on Green Island (*Lat. 10° 16′ N., Long. 119° 30′ E.*) are visible, those on Johnson island are a little higher.

Puerco islet lies on a reef, which dries, about 6 miles south-westward of Flechas point; Reef islet, 30 feet ($9^{m}1$) high, lies on a reef about 2½ miles south-south-westward of Puerco islet. Shell island and Flat island lie about 3 miles northward and 1¾ miles north-westward, respectively, of Johnson island. Stanlake island and Howley islet lie about 3 and 4¾ miles, respectively, westward of Johnson island.

There are numerous banks and shoals in the bay, which are mostly surrounded by much greater depths, and are shallowest near the middle. Under favourable conditions the bottom can be seen in a depth of about 8 fathoms ($14^{m}6$), and often a shoal of this depth can be seen at a distance. The soundings give very little warning, and on any sudden change in depth vessels should proceed with great caution. There are channels between the islands and reefs and the Palawan coast, but they are narrow and tortuous, and should not be attempted by vessels without local knowledge.

Bay peak, 1,795 feet ($547^{m}1$) high, lying 3¼ miles westward of Flechas point, is separated from the higher peaks northward of that point by a deep valley, and may be easily identified at night by the low land westward. The highest point of the Barbacan (Barbakan) range is a rounded hill, 1,210 feet ($368^{m}8$) high, situated 10½ miles westward of Bay peak; it is covered with trees, with a small knob on the western side. A conical wooded hill, 690 feet ($210^{m}3$) high, lies 2¼ miles westward of Barranca point, which is situated about 19 miles south-westward of Flechas point, and is an excellent landmark. These peaks are seldom obscured by clouds, while the higher mountains in the interior are frequently hidden. There are several settlements along the coast between Flechas and Bold points.

At the south-western end of Green Island bay, lying close offshore, are North Verde island and South Verde island, separated from the main island by Pascoe (Pasco) channel, and about one mile northward is Reinard island. The settlement of Caramay (Karamai) is situated at the northern end of Caramay bay, about 5 miles south-south-westward of Barranca point.

Anchorages.—Directions.—Anchorage may be obtained by vessels with local knowledge off Caramay, in depths of from 3 to 6 fathoms ($5^{m}5$ to $11^{m}0$), mud, or between Reinard island and the Palawan coast, in a depth of about 11 fathoms ($20^{m}1$), mud.

There is an excellent typhoon anchorage for small vessels in Pascoe channel westward of North Verde island, but the channel for entering is very narrow and should not be attempted by vessels without local knowledge unless it is marked. The channel between South Verde island and the coast of Palawan is shallow and foul.

To enter Caramay harbour from eastward, a vessel should steer for the northern end of Reinard island, bearing 270°, and pass from a quarter to half a mile northward of the island and thence to the anchorage. If approaching from southward, a vessel with local knowledge may enter by South channel between Reinard and North Verde islands, being careful to avoid Zabala reef, which is awash, situated one mile south-eastward of Reinard island (*Lat. 10° 09′ N., Long. 119° 15′ E.*).

Charts 967, 2660b, 1263.

Chart 3809.

Off-lying shoals.—Charybdis shoal, with a depth of 1¾ fathoms ($3^{m}2$) over it, lies about 18 miles east-south-eastward of North Verde island (*Lat. 10° 06′ N., Long. 119° 15′ E.*).

Pasig shoal, with a depth of 7 feet ($2^{m}1$) over it, and steep-to on its eastern side, and Constancia shoal, with a depth of 10 feet ($3^{m}0$) over it, lie about 19 and 13½ miles, respectively, south-eastward of North Verde island. Between these shoals, which show distinctly with a favourable light, is a 3½-fathom ($6^{m}4$) patch and other shoals, with depths of from 4 to 8 fathoms ($7^{m}3$ to $14^{m}6$) over them.

West Pasig shoal, with a depth of 2 fathoms ($3^{m}7$) over it, lies about 10½ miles south-eastward of South Verde island.

Chart 967.

Honda bay.—Honda bay is the large bight between Bold point and Bancaobancaon point, the northern entrance point of Puerto Princesa, about 29 miles south-westward, and is similar to Green Island bay, containing numerous islets, shoals, and banks, surrounded by moderate depths. The northern shore consists of sand and coral beaches with high hills rising almost from the water's edge ; these hills are separated by deep well defined valleys, and in rear of them rise the high mountains of this part of Palawan. The head of the bay is fringed by mangrove which extends about a quarter of a mile offshore.

Bold point may be identified by Sharp peak and Dome peak, each about 3,000 feet ($914^{m}4$) high, lying from about 2 to 2¾ miles northward of it. These peaks are frequently seen when the higher mountains are in the clouds.

Mangrove point, about 4½ miles westward of Bold point, is a good landmark, as it is the only prominent clump of mangroves on this part of the coast. Emmit point, about 6 cables west-south-westward of Mangrove point, is higher, but not conspicuous. Coral reefs extend about 3 cables from both points, and between them is a sheltered cove, which affords protection for small craft. Pasco point, 2¾ miles west-south-westward of Emmit point, is low with a few scattered mangroves on it. A shoal, with a least known depth of 5 feet ($1^{m}5$) over it, lies midway between Mangrove and Pasco points and about three-quarters of a mile offshore ; it lies near the northern edge of an extensive bank, over which there are depths of 4 and 5 fathoms ($7^{m}3$ and $9^{m}1$).

Tinabog is a small village, not visible from seaward, about 1¼ miles westward of Pasco point. A reef awash, lies 3 cables offshore and about three-quarters of a mile south-westward of the entrance to Tinabog river, which flows out by the village. Castillo point, 3 miles westward of Tinabog village, probably derives its name from a rocky protuberance, 125 feet ($38^{m}1$) high, on the brow of a hill over it, which marks the western end of a bold range of hills which borders the coast from Green Island bay ; it lies about midway between Tinabog and Babuyan, 5½ miles farther westward, the two most important villages on the northern side of Honda bay.

Babuyan river, which discharges about one mile southward of Babuyan village, can be entered at high water by boats with a draught of not more than 6 feet ($1^{m}8$), which can ascend as far as the village. A boat entering should keep the north-eastern extremity of Fondeado island astern, bearing 148°, which leads into the river entrance.

Westward of Babuyan, the immediate coast is low and swampy, and is heavily wooded ; the first 4 miles is a narrow sandy beach,

Chart 967.

while the remainder is fringed by mangroves. About 6 miles south-westward of the western entrance point of Babuyan river is Addison point (*Lat. 9° 56′ N., Long. 118° 48′ E.*), which forms the eastern entrance point of Tapul bay. Bush island, a low island covered with mangroves, lies in the entrance to Tapul bay, and a reef, which dries, lies 2¾ cables southward of Addison point ; between this rock and Bush island there is a good channel leading into Tapul bay.

Mount Peel, 3,655 feet (1,114^{m}1) high, 6¼ miles north-westward of Addison point ; Mount Airy, 2,045 feet (623^{m}3) high, 3½ miles south-westward of Mount Peel ; Mount Herschel, 2,316 feet (705^{m}9) high, about 4 miles south-westward of Mount Airy ; and Conical hill, 1,190 feet (362^{m}8) high, about 5 miles north-north-eastward of Addison point, are the most prominent objects when approaching Honda bay.

The western shore of Honda bay is bordered with low hills, with lower land behind them. Immediately northward of the entrance to Bacungan river, situated 4¼ miles south-westward of Addison point, lies a well defined red ridge ; south-westward of the river entrance there is a confused mass of hills, valleys, and peaks, extending to Mount Beaufort, situated about 8 miles south-westward of the southern entrance point of the river, and to Thumb peak, 2¼ miles farther south-westward.

Bacungan river can be entered by large launches, which, with the flood stream, can ascend to the town of the same name about 6 miles from the mouth. A reef, which dries, extends one mile eastward from the northern side of the entrance to this river.

Islands and dangers.—Panglima reef, with a least known depth of 3 fathoms (5^{m}5) over it, lies 4¾ miles south-eastward of Pasco point, and is the outer danger of Honda bay. About 2½ miles southward of Pasco point is an extensive bank, with a least depth of 5 feet (1^{m}5) over it.

Fondeado island, about 110 feet (33^{m}5) high to the tops of the trees, lies 2½ miles south-south-westward of Castillo point, and is fringed by a coral reef, which extends from about one to 2 cables offshore. The eastern half of the island is covered by mangroves, and a sandspit extends a quarter of a cable from the north-western point. Numerous shoals, several of which dry, lie between the island and the Palawan coast northward, with deep, narrow, tortuous channels between them. Several shoals, with depths of from 3 to 5 fathoms (5^{m}5 to 9^{m}1) over them, lie from one to 4 miles eastward and south-eastward of Fondeado island, and depths of from 6½ to 9 fathoms (11^{m}9 to 16^{m}5) lie within 7½ miles south-eastward.

Arrecife island, 115 feet (35^{m}0) high, lies on a large coral reef 2½ miles south-westward of Fondeado island ; it is bordered by a white sandy beach with some mangrove on its eastern and western sides ; it may be identified by a clump of mangroves on the reef about 2½ cables south-westward of the island.

A 4¾-fathom (8^{m}7) patch lies about 1¾ miles east-north-eastward of Arrecife island (*Lat. 9° 55′ N., Long. 118° 53′ E.*), with a 3-foot (0^{m}9) patch between, and a 4¾-fathom (8^{m}7) patch lies 2 miles south-south-eastward of the island. A shoal, with a least depth of 8 feet (2^{m}4) over it, lies 2¾ miles southward of the island, on the northern side of the channel leading to Tapul bay. A shoal, with a depth of 5½ fathoms (10^{m}1) over it, and another, with a depth of 4¼ fathoms (7^{m}8) over it,

Charts 2660b, 1263.

Chart 967.

lie 4¾ miles south-south-eastward and 5 miles south-south-westward, respectively, of Arrecife island.

North-westward of a line joining Arrecife island and Bancaobancaon point, there are many islands and reefs, amongst which only vessels with local knowledge should navigate. Makesi and Ramesamey islands lie about 4½ and 7½ miles, respectively, south-westward of Arrecife island (*Lat. 9° 55′ N., Long. 118° 53′ E.*).

Anchorages.—Anchorage may be obtained by vessels with local knowledge in the following positions in Honda bay:—About 1½ miles south-eastward of Tinabog, in a depth of 11 fathoms ($20^{m}1$), mud, with the south-eastern point of Fondeado island, bearing 240°, and Pasco point 012°; or small craft may find better protection, in depths of from 7 to 10 fathoms ($12^{m}8$ to $18^{m}3$), southward of the entrance to Tinabog river, with the reef awash south-westward of the entrance, bearing 270°, distant half a mile.

About half a mile northward of the eastern extremity of Fondeado island, in depths of from 9 to 10 fathoms ($16^{m}5$ to $18^{m}3$), sand, sheltered from the south-westward by the island, and from the north-eastward by an extension reef, which dries.

In Tapul bay, in depths of from 5 to 6 fathoms ($9^{m}1$ to $11^{m}0$), mud.

Chart 2914.

Puerto Princesa.—Light.—Puerto Princesa, situated at the southern end of Honda bay, is entered between Bancaobancaon point and Panagtaran point, 2 miles southward. The shores are bordered by a densely wooded plain backed by a chain of mountains, of which Mount Beaufort 3,645 feet ($1,111^{m}0$) high and Thumb peak, 4,220 feet ($1,286^{m}3$) high, are prominent. The latter, when seen from south-eastward, appears as a steep conical mountain with a knob on the summit; both peaks are frequently obscured by cloud. Table head, about 3½ miles south-south-westward of Panagtaran point, though only 548 feet ($167^{m}0$) high, is a useful landmark for making the port; it is readily identified, as it is only about 2 cables from the coast and is the termination of a gradually ascending range of hills extending south-westward. *See* view facing this page.

Bancaobancaon point is low and fringed with mangroves, which extend almost to Tidepole (Saboruko) point, a reddish cliff, about 20 feet ($6^{m}1$) high, about 2 miles west-north-westward.

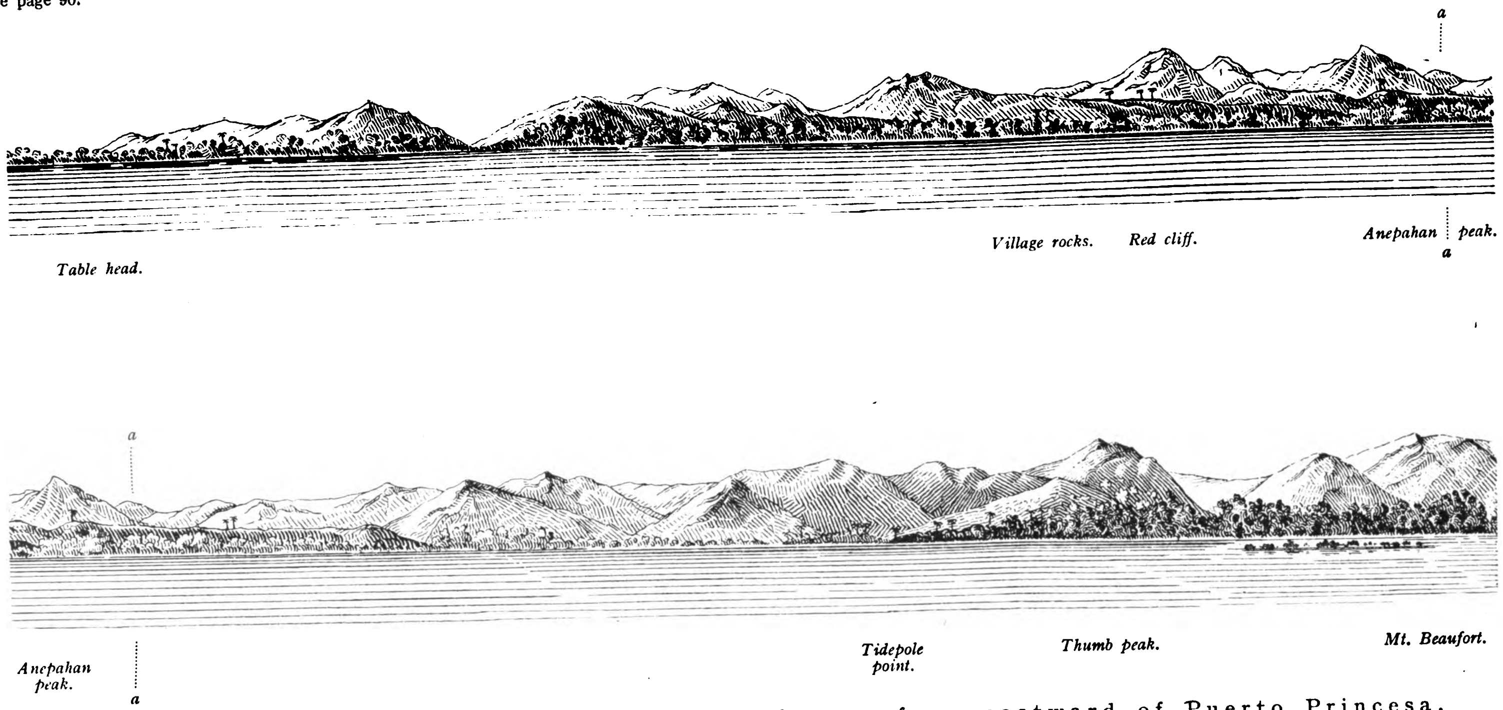
A light is exhibited, at an elevation of 43 feet ($13^{m}1$), from an iron framework structure on a white house, on Tidepole point.

On the southern side of the entrance are Saguit and Abucayan inlets, the shores of which are fringed with mangroves. About a quarter of a mile eastward of Red cliff, the north-western entrance point of Saguit inlet, are Village rocks, so named on account of their resemblance to a group of native huts when first seen. Between them and Tabuntabun point, the south-eastern entrance point of the inlet, is a channel about 3½ cables wide, which leads to an anchorage for small vessels at the head of Saguit inlet.

Abucayan inlet is entered close north-westward of Saguit inlet; Heron point, the northern entrance point, has been cleared and planted with coconut trees. The navigable channel at the entrance is only about one cable in width between the reefs extending from either side, which are clearly visible under favourable conditions. Inside the

Charts 2660b, 1263.

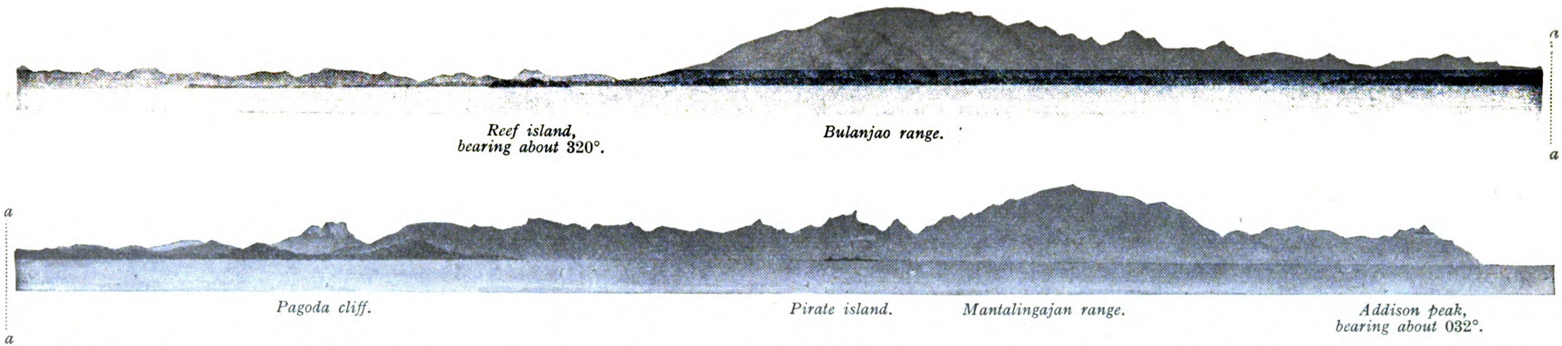
To face page 90.


a
Table head.
Village rocks.
Red cliff.
Anepahan peak.
a
a
Anepahan peak.
a
Tidepole point.
Thumb peak.
Mt. Beaufort.

View, in two parts, of the east coast of Palawan, from eastward of Puerto Princesa.

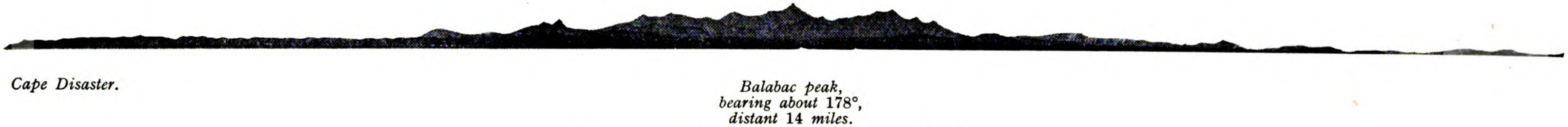
(*Original dated* 1918.)

To face page 91.



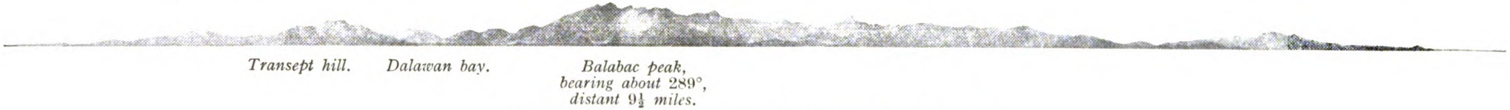
View, in two parts, of the south-east coast of Palawan, from one mile north-westward of Ursula island.

(*Original dated* 1851.)


Cape Disaster.
Balabac peak,
bearing about 178°,
distant 14 miles.

Balabac island, from northward.

(*Original dated* 1851.)


Transept hill.
Dalawan bay.
Balabac peak,
bearing about 289°,
distant 9½ miles.

Eastern side of Balabac island.

(*Original dated* 1851.)

Chart 2914.

entrance the inlet widens, but reefs, which are steep-to, extend from either shore, and local knowledge is necessary for its safe navigation.

Iwahig river flows into the western side of the port opposite the town; in its entrance is River islet (*Lat. 9° 44′ N., Long. 118° 42′ E.*), on the southern side of which is the channel into the river; a depth of 6 feet (1^m8) can be carried at half-tide, but the river is subject to freshets and consequent changes in the channel. About 4 miles up the river, on the northern side, is the village of Iwahig, where there is a penal colony. Here there is a machine shop, where minor repairs can be effected; a few provisions may be obtained in case of emergency.

Several rivers flow into the head of the port.

Dangers.—Buoys.—The entrance to Puerto Princesa is contracted to a width of about 8½ cables between the reefs extending from both sides. Tidepole point in line with Mount Beaufort, bearing 311°, just clears the reef extending from the southern side, but it should not be used as a leading mark for entering the harbour.

Vinagre reef, with a rock awash near its centre, lies on the western side of the fairway, about 1¼ miles west-south-westward of Tidepole point. A shoal, with a depth of 13 feet (4^m0) over it, lies about one mile westward of the same point. A spherical buoy, painted in red and black horizontal bands, is moored close south-eastward of this shoal.

Gedeon shoal, with a least depth of one fathom (1^m8) over it, lies 4 cables westward of the head of the wharf at Puerto Princesa, and is marked on its eastern side by a black can buoy; a shoal, with a depth of 2½ fathoms (4^m6) over it, lies half a mile west-south-westward of the wharf.

A shoal, with a depth of 1½ fathoms (2^m7) over it, lies 6½ cables north-westward of the head of the wharf. North-westward of a line passing through this shoal and the entrance to Iwahig river there is foul ground.

A spherical buoy, painted in red and black bands, is moored about 1¾ miles west-north-westward of the head of the wharf.

Charts 2914, 967.

Anchorage.—Directions.—Anchorage may be obtained, in a depth of from 9 to 10 fathoms (16^m5 to 18^m3), mud, about 2 cables northward of the head of the wharf; it is well protected and is recommended as a good typhoon anchorage.

If approaching the entrance from northward a vessel should give the coast lying between Bancaobancaon point and a point about 5 miles northward of it a berth of at least 1½ miles as shoal water extends offshore, and if from southward at least one mile. A vessel entering should steer for Tidepole point light-structure, bearing 304°, until between the two entrance points, when she should steer 290° until the light-structure bears 040° when she should steer 349° until the wharf is abeam, when she may alter course for the anchorage.

At night, when approaching Puerto Princesa, the shore lights in the vicinity of Canigaran (Conigaron), about 1½ miles northward of Bancaobancaon point (*Lat. 9° 43′ N., Long. 118° 46′ E.*) are visible some time before those at Puerto Princesa can be seen, and may cause some confusion to a stranger.

Town.—The town of Puerto Princesa, situated between Tidepole point and Princesa point, about 7 cables northward, is the capital of the province of Palawan. Its white Government buildings present an imposing appearance from the harbour. A concrete T-shaped wharf,

Charts 2660b, 1263.

Charts 2914, 967.

116 feet (35^{m}4) long, with a depth of 20 feet (6^{m}1) alongside its head, in 1948, extends in a north-westerly direction from Princesa point.

Fresh water may be obtained from the wharf. Very few supplies are obtainable.

Radio station.—There is a radio station at Puerto Princesa. *See* page 14.

Climatic table.—*See* page 29.

Chart 967.

Coast.—About 2 miles south-south-westward of Panagtaran point is Bay point, the north-eastern entrance point of Binunsalian bay; the shores of this bay are fringed by reefs, and it is open south-eastward. A narrow channel leads from its head into an inner basin, named Turtle bay, which affords good shelter for small craft with local knowledge. Table head, one mile south-south-westward of the southern entrance point of Binunsalian bay, has been described on page 90. A sand and coral shoal, which dries, lies in the middle of Turtle bay at the outer extremity of a shallow spit extending from its head.

Aspect.—Central peak, a sharp peak, 3,205 feet (976^{m}9) high, is the northern one of a central range which is separated from the higher mountains near the west coast of Palawan by a deep valley; it lies about 9 miles westward of Table head. Anepahan (Anipahan) peaks, 4,200 feet (1,280^{m}2) high, lie in this latter range, about 8 miles westward of Central peak; the northern peak is sharp and the southern one flat. About 10 miles south-westward of Central peak is Mount Aborlan, 2,505 feet (763^{m}5) high, which is the most prominent peak in the central range; about 12 miles farther south-westward are the Victoria peaks, 5,665 feet (1,726^{m}7) high, a massive formation with numerous peaks and deep gorges. A wide fertile valley separates these peaks from the Sultan range, about 9 miles farther south-westward, with Sultan peak, 3,820 feet (1,164^{m}3) high, at the northern end of the range.

Coast.—A wide level plain, densely wooded, rises from the coast to the mountains. The greater part of the coast is fringed with mangroves, and a coral reef extends from a quarter of a cable to one cable offshore. The great depths which come close to the coast southward of Puerto Princesa, give way about 7 miles south-westward of Panagtaran point to a gradually widening bank, on which there are many dangerous shoals. The edge of this bank is frequently marked by tide-rips, and a considerable current may be experienced in the vicinity, which, however, is not felt farther offshore or on the bank itself.

Tagbarunis point, about 9 miles south-westward of Panagtaran point (*Lat. 9° 41′ N., Long. 118° 46′ E.*), is covered with mangroves and is not prominent. Tagbarunis river discharges about half a mile north-eastward of Tagbarunis point; it has a depth of 3 feet (0^{m}9) over its bar at half-tide, and small boats can ascend about half a mile. Inagauan village, about 1½ miles south-westward of Tagbarunis point, is not visible from seaward, but its position may be identified by a high sandy beach in front of it. A peak, 1,755 feet (535^{m}0) high, situated about 4½ miles westward of Tagbarunis point, is prominent on account of its perfect cone-shaped summit and the flat country immediately southward of it. Inagauan river, with a depth of 3 feet (0^{m}9) on its bar at half-tide, discharges one mile north-north-eastward of Inagauan village. Small boats can ascend the river for about 2 miles.

Charts 2660b, 1263.

Chart 967.

Anchorage may be obtained by vessels with local knowledge in fair weather, in a depth of about 5 fathoms ($9^{m}1$), mud, off Inagauan village. In approaching this anchorage from eastward care should be taken to avoid the shoals, with depths of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$) over them, which lie on a spit, with general depths of less than 10 fathoms ($18^{m}3$) over it, extending 3 miles south-south-eastward from the mouth of Tagbarunis river.

Village bay, entered between Maasin point, 4 miles south-south-westward of Tagbarunis point, and Puntog islands, about one mile farther in the same direction, is encumbered with numerous coral reefs, making it unsafe to enter. Isog river flows into the northern part of the bay. Puntog islands are two small mangrove islands lying close offshore on the coastal reef.

Malanao island, about 65 feet ($19^{m}8$) high to the tops of the trees, flat and covered with mangroves, lies one mile southward of Puntog islands and the same distance offshore. A reef extends about 3 cables from the south-western side of the island. The channel between the island and the coast of Palawan is foul, and vessels should not attempt to pass through the intricate channels among the reefs, many of which dry. Small craft with local knowledge with a draught of 8 feet ($2^{m}4$), may, however, pass through the channel keeping close to the western side of Malanao island.

Anchorage may be obtained by small vessels with local knowledge in Malanao anchorage, between Cutter point, situated 4¾ miles south-westward of Maasin point, and Malanao island, in a depth of 3½ fathoms ($6^{m}4$), mud. The usual commercial anchorage is off the mouth of Aborlan river, in depths of from 4 to 5 fathoms ($7^{m}3$ to $9^{m}1$).

Vessels should approach this latter anchorage with the southern entrance to the river bearing 270°, passing about 3½ cables southward of Malanao island, and northward of a 26-foot ($7^{m}9$) patch about one mile southward of the island.

Aborlan river flows out through two mouths, one on either side of an island, situated about 1¼ miles south-westward of Cutter point. The northern mouth is the deeper channel, and boats that can cross the bar, over which there is a depth of 3 feet ($0^{m}9$) at half-tide, can ascend the river as far as the wharf at the town of Aborlan, about 2 miles from the entrance.

Calver point (*Lat. 9° 22′ N., Long. 118° 33′ E.*), about 5 miles south-westward of Cutter point, is a promontory covered with mangroves; between the two extremities of this promontory is Lolo bay, in which there is a light yellow sandy beach which is a useful leading mark for approaching the anchorage near the point. Good protection during the South-west monsoon may be obtained by vessels with local knowledge, north-north-eastward of Calver point, in a depth of 4 fathoms ($7^{m}3$), mud. Maasin river flows out on the northern side of the point, and Tigman river on the southern side.

Sombrero island, about 3¾ miles south-westward of Malanao island, is a thickly wooded sand cay, about 119 feet ($36^{m}3$) high to the tops of the trees. The coral reef on which it lies extends about half a mile north-eastward from the northern end and a quarter of a mile from the southern end.

There are several reefs which dry lying westward of the line joining Malanao and Sombrero islands.

Charts 2660b, 1263.

Chart 967.

Off-lying dangers.—A 2¾ fathom (5^{m}0) patch lies 2¼ miles east-south-eastward of Maasin point, and a 4¾-fathom (8^{m}7) patch lies about 3½ miles eastward of the northern point of Malanao island; both shoals lie on a bank with depths of less than 10 fathoms (18^{m}3) over it. About 6 miles eastward of Sombrero island there is a bank of sand and coral, over which there is a least depth of 3¼ fathoms (5^{m}9), extending from eastward of Malanao island for 10 miles southward.

Coast.—About 2 miles south-westward of Calver point is Apoapuraguan point with the river of the same name discharging close westward of it; the point is low and covered with mangroves, with coral cliffs, about 10 feet (3^{m}0) high, on its southern side. Native point, 4¾ miles south-westward of the southern extremity of Calver point, is low and heavily wooded, and is fringed by a reef which extends half a cable offshore. Arena island, about 65 feet (19^{m}8) high to the tops of the trees, lies on the western part of a reef situated about 2¾ miles southward of Native point. There are several sunken dangers lying north-westward of the line joining Sombrero and Arena islands. A 4¼-fathom (7^{m}8) patch lies about 2 miles southward of Sombrero island, and a 5½-fathom (10^{m}1) patch lies 3¾ miles south-eastward of the same island. Two 5-fathom (9^{m}1) patches lie 4½ and 6 miles, respectively, north-eastward of Arena island.

About 3 miles west-south-westward of Native point is Panacan (Panakan) point, and 2¼ miles farther south-south-westward is Casuarina point, which is remarkable for the high trees on it; a sand spit, which dries, extends about 4 cables eastward from the latter point, and a reef, which dries, lies half a mile southward of the point. A rock, nearly awash, lies a quarter of a mile south-eastward of the reef which dries, and two sunken rocks are reported to lie about a quarter of a mile farther south-eastward.

The village of Panacan (Panakan), at the mouth of Panacan river, about one mile northward of Casuarina point, may be identified by the bright tin roof of a large house. The native village is situated along the coast south-westward of Casuarina point.

Rasa island, about 80 feet (24^{m}4) high to the tops of the trees, lies with its north-western extremity about three-quarters of a mile eastward of Casuarina point (*Lat. 9° 15′ N., Long. 118° 25′ E.*); it has only a few trees on it and is difficult to distinguish from the main island when approaching from seaward. Between Rasa island and the coast of Palawan westward is Mantaquin (Mantakwin) bay, which affords good protection from north-eastward to vessels with local knowledge. Anchorage may also be obtained by vessels with local knowledge about three-quarters of a mile north-eastward of Casuarina point, in a depth of about 4 fathoms (7^{m}3), mud.

Off-lying dangers.—A 4-fathom (7^{m}3) patch lies about 3½ miles south-eastward of Rasa island, and a 6½-fathom (11^{m}9) patch lies 6¾ miles farther in the same direction; the bottom is visible over this patch, and there are tide-rips in its vicinity. A 3¾-fathom (6^{m}9) patch lies about 4¾ miles southward of Rasa island. There are several shoals lying between Arena and Rasa islands.

Coast.—Between Casuarina point and Bivouac point, 6 miles south-westward, there is a succession of sandy beaches and mangrove points and islands. Emelina island, low and wooded, lies about 3¼ miles south-westward of Casuarina point, and 6½ cables offshore; it is fringed

Charts 2660b, 1263.

Chart 967.

with mangrove, and a white sand and coral spit extends 1¼ cables from its northern end.

The coast between Bivouac point and Relief point, about 7½ miles westward, is fairly regular, low, and flat, practically free from mangroves and is bordered by a fine sandy beach.

Island bay.—Island bay is entered between Relief point and Ingiaran point, the north-eastern entrance point of Crawford cove, about 10 miles south-westward.

There are numerous dangerous shoals in the bay and its approach, so that only vessels with local knowledge should attempt to enter it. Arrecife, Bessie, and Gardiner islands are three low islands fringed by reef, lying in the south-western part of the bay, the latter being about 1¼ miles eastward of Ingiaran point. Several other islands lie between these islands and the head of the bay. Crawford cove extends about one mile inland and has a depth of 5 fathoms ($9^{m}1$) in its entrance. On the northern side of the cove is the southern extremity of a coastal range.

Off-lying island and dangers.—Altnacraig shoal lies 10½ miles southward of Bivouac point; it has a least known depth of 3 feet ($0^{m}9$) over it, the bottom is distinctly visible and discoloration of the water may be seen at a distance of one mile. Heavy tide-rips are frequently encountered in its vicinity. A 4½-fathom ($8^{m}2$) patch and a 4¾-fathom ($8^{m}7$) patch lie about 5 miles northward and 3½ miles north-westward, respectively, of Altnacraig shoal.

Marabout shoal, about 3¾ miles southward of Altnacraig shoal, is composed of coral and is reported to have a depth of 17 feet ($5^{m}2$) over it. Between these two shoals there are several patches with depths of 9 and 10 fathoms ($16^{m}5$ and $18^{m}3$) over them.

Tagalinog island, about 80 feet ($24^{m}4$) high to the tops of the trees, lies about 13 miles south-eastward of Scott point, the south-western entrance point of Crawford cove; it is fringed by a reef, which extends from one to 2½ cables from it. Barracuda reef, with a depth of 3 fathoms ($5^{m}5$) over it, lies about 8½ miles southward of Scott point. Talakitok reef, with a depth of 2¼ fathoms ($4^{m}1$) over it, lies about 5 miles east-south-eastward of Scott point.

Between the line joining Altnacraig shoal and Tagalinog island and the coast of Palawan there are other dangerous shoals.

Caution.—It must be borne in mind that in a region which is so studded with isolated rocks and shoals, all dangers to navigation may not have been found during the survey, and that extreme caution is necessary when navigating in this vicinity.

Coast.—Light.—About 10 miles south-south-westward of Scott point (*Lat. 9° 02′ N., Long. 118° 05′ E.*) is Nariz point which is low and wooded, with a small hill behind it, and about one mile northward of the latter is the entrance to Caramay bay, a small inlet which affords protection for small craft with local knowledge; Caramay river flows into the head of the bay.

The coast south-westward of Nariz point is low and heavily wooded; this low land extends from 2½ to 3 miles inland to the base of the mountain range of this part of Palawan; the coast is bordered by a reef, with several shoals and rocks close inshore. At Filantropia point, 5 miles south-westward of Nariz point, the reef extends about 3½ cables offshore.

Charts 2660b, 1263.

Chart 967.

Sir James Brooke point, about 7 miles south-westward of Filantropia point, is low and inconspicuous. Small vessels with local knowledge may obtain anchorage with good protection during northerly and north-easterly winds, in depths of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$), in Ipolote bay, on the western side of Sir James Brooke point. Addison peak, 3,095 feet ($943^{m}4$) high, situated 4¼ miles north-westward of Sir James Brooke point, is a good landmark; it is very steep on its eastern and western sides, and is usually clear of clouds except in the rainy season from May to December. The mountains farther inland are frequently covered with clouds.

A light is exhibited, at an elevation of 35 feet ($10^{m}7$), from the cupola of a blockhouse, on Sir James Brooke point.

There is a settlement at Sir James Brooke point; it is of little commercial importance, but is the seat of government for the Moro settlement of Palawan.

Coast.—A reef extends about 2½ cables from Tami point, situated about 4½ miles south-westward of Sir James Brooke point. Tacbolulu is a small settlement south-westward of Tami point.

Seygam islands are two large clumps of mangroves on the coastal reef, about 9 miles west-south-westward of Tami point. The best passage along this part of Palawan is close to the coastal reef inside the numerous shoals lying about 3 miles offshore, but it should only be used by vessels with local knowledge.

Aspect.—From the parallel of 9° 15′ N. a central range of mountains extends about 40 miles south-westward to Mount Mantalingajan (Mantalingahan), 6,740 feet ($2{,}054^{m}4$) high; in this range there are several remarkable peaks, the two highest of which are Mount Gantung, about 5,850 feet ($1{,}783^{m}0$) high, and Mount Landargun, about 5,430 feet ($1{,}655^{m}0$) situated 12 and 9 miles, respectively, north-eastward of Mount Mantalingajan. About 3 miles north-eastward of Mount Gantung there is a table hill, with a sharp nipple, named Calibugon (Kalibugon), and 2½ miles farther north-eastward is Corumi (Korumi), a conical mountain, 3,892 feet ($1{,}186^{m}3$) high. *See* view facing page 91.

Caution.—Off the coast between Nariz point and Dougal point, about 21 miles south-westward, and north-westward of a line joining a position 16 miles south-south-eastward of the former point and 20 miles south-eastward of the latter, there are many dangerous shoals, the positions of which may be seen on the chart.

San Antonio bay.—San Antonio bay, entered between Seygam islands and Sarap point (*Lat. 8° 34′ N., Long. 117° 32′ E.*), about 7 miles south-westward, is encumbered with numerous reefs and shoals, both in the approach and in the bay. Discoloured water from several rivers which flow into the western part of the bay makes these dangers difficult to distinguish. Iwahig river, one of these, has a depth of 2½ feet ($0^{m}8$) on its bar, with greater depths inside; it is the largest river in southern Palawan and drains a fertile and populous valley. Bonobono, on the northern shore, is the most important settlement.

Islands and dangers.—Huevo shoals, with a least depth of one fathom ($1^{m}8$) over them, are a group of small shoals with deep channels between them, lying about 3 miles south-eastward of Seygam islands. Vessels should not attempt to pass between the shoals.

Charts 2660b, 1263.

Chart 967.

Egg island is a small sand cay situated on a reef about 3½ miles southward of Seygam islands; the position of the cay is continually shifting on the reef, due to storms. Gull reef, which dries about 2 feet (0^{m}6), and is steep-to on its south-eastern side, lies about 1½ miles south-south-westward of Egg island. Pirate island is a small flat island with some high trees on its north-eastern point, lying about 1½ miles south-eastward of Sarap point. A reef extends about half a mile from the eastern end of the island. Vessels with local knowledge may obtain anchorage sheltered from south-westerly winds, in a depth of 16 fathoms (29^{m}3), mud, northward of Pirate island.

Caution.—Vessels not bound for San Antonio bay should not close this part of the coast nearer than 8 miles, as local knowledge is indispensable for safe navigation among the numerous coral shoals of this region.

Aspect.—Pagoda cliff, about 5 miles north-westward of the head of San Antonio bay, is a remarkable limestone cliff, 2,400 feet (731^{m}5) high, having a table summit with two clefts, which form pinnacles at either extremity, the southern pinnacle being the sharper; there is a small rock in the gap, prominent on a north-westerly and opposite bearing. Pagoda cliff rises immediately above a plain, which extends across the island, separating the Bulanjao (Bulanhau) and Mantalingajan ranges, being connected with the latter by a high ridge with various peaks of similar character and formation.

Westward of San Antonio bay and nearly in the centre of the island, is the Bulanjao range, which attains an elevation of about 3,470 feet (1,057^{m}7). It is of a reddish aspect, and has a long smooth summit, of which it is difficult to distinguish the highest part. The northern slope has several small sharp peaks with steep shoulders and ravines, amongst the most prominent of which is Low Hock, 1,080 feet (329^{m}2) high, situated 6 miles south-south-westward of Pagoda cliff, and generally visible even when the adjacent hills are obscured. *See* view facing page 91.

Coast.—Iglesia point (*Lat. 8° 30′ N., Long. 117° 25′ E.*), about 5½ miles south-south-westward of Sarap point, is low and flat, consisting mostly of mangrove. A flat-topped hill just northward of the point is a good landmark for this vicinity. Fair anchorage may be obtained during the North-east monsoon by vessels with local knowledge, westward of the point, in depths of from 6 to 7 fathoms (11^{m}0 to 12^{m}8), mud, being careful to avoid a 1½-fathom (2^{m}7) patch almost in the centre of the anchorage space.

Coral bay is the name given to the area between the coast of Palawan and Pandanan and Bugsuk islands, close off the southern extremity of Palawan. It is encumbered with many shoals and reefs, the latter frequently having sand cays near their western edges; these reefs break the swell coming from the Sulu sea during the North-east monsoon, but leave a choppy sea in the bay. The area between Arrecife island and the northern end of Bugsuk island, situated 4½ and 14 miles, respectively, south-westward of Iglesia point, is extremely foul.

There is a good typhoon anchorage for vessels with local knowledge behind the larger of the Cabugan islands, situated close offshore, about 14 miles west-south-westward of Iglesia point, in a depth of 7 fathoms (12^{m}8) mud. To enter Coral bay, a vessel should pass northward of Arrecife island; it may also be entered from westward

Charts 2660b, 1263.

Chart 967.

through a deep narrow channel between Pandanan island and the coast of Palawan.

Cape Buliluyan, the southern extremity of Palawan, is a low wooded shelving point, fronted by mangroves, with depths of from 4 to 8 fathoms (7^m3 to 14^m6) close off its southern side, and from 28 to 30 fathoms (51^m2 to 54^m9) between its eastern side and the northern end of Pandanan island. The western side is fringed by a reef, which dries, extending from 3 to 5 cables offshore, with depths of 6 fathoms (11^m0), mud, close to the edge. A 2¼-fathom (4^m1) patch lies about one cable southward of the cape.

For the western side of Palawan, *see* China Sea Pilot, Vol. II.

Off-lying island and dangers.—Circe shoal, charted in lat. 8° 26′ N., long. 117° 56′ E., was reported, in 1862, by the Spanish Government ship *Circe* to have a depth of 4½ fathoms (8^m2), coral, over it; its existence is considered doubtful.

Wakefield shoal has a least known depth of 2 fathoms (3^m7), coral and sand, over it, and is steep-to on its western side; it lies about 25 miles south-eastward of Iglesia point. It is probable that Wakefield and Circe shoals are identical.

Wright shoal, with a least depth of one fathom (1^m8) over it, and steep-to, lies 14½ miles south-eastward of Iglesia point.

Argyll shoal (*Lat. 8° 21′ N., Long. 117° 35′ E.*), with a depth of 2 fathoms (3^m7) over it, and steep-to, lies about 10½ miles south-south-eastward of Iglesia point. In 1892, the British barque *Argyll* was totally lost by striking this shoal.

Ursula island, 9¼ miles southward of Iglesia point, is a low sandy island densely covered with vines and trees, the tops of the latter being about 100 feet (30^m5) high. A reef extends three-quarters of a mile north-eastward from the island. The best landing place is on the north-western side of the island.

A 2¼-fathom (4^m1) patch and a 3¾-fathom (6^m9) patch lie about 3½ miles southward and south-south-eastward, respectively, of Ursula island.

There are several dangerous shoals between Ursula and Arrecife islands.

Charts 2660b, 1263.

CHAPTER IV

ISLANDS AND CHANNELS BETWEEN PALAWAN AND BORNEO—NORTH-EAST COAST OF BORNEO FROM TANJONG SAMPANMANGIO TO SANDAKAN

Charts 948, 967.

GENERAL REMARKS.—Between the southern part of Palawan and the northern part of Borneo are several smaller islands, of which Pandanan, Bugsuk, Bancalan (Bankálan), Mantangule, the large elevated island of Balabac, and others form the northern group. Southward of this group is Balabac strait, which connects the China and Sulu seas. The islands of Balambangan, Banguey, and Mallawallé, with many islets and rocks, form the southern group, and lie on the southern side of Balabac strait.

Climate and weather.—*See* page 16.

Chart 967.

Islands and dangers off the southern end of Palawan.—Pandanan island, southward of Cape Buliluyan (page 98), is low, flat, and densely wooded; its coast is fringed partly with mangrove and partly with rock, about 10 feet ($3^{m}0$) high. A small settlement is situated on the western side of the island. The area north-eastward of Pandanan island is encumbered with reefs which extend into Coral bay. The reef which fringes the south-western and southern sides of the island dries and extends from about 2 to 2½ miles offshore.

About three-quarters of a mile off the north-western side of Pandanan island, lying on the south-eastern edge of a coral reef, is Dalahican island, with a deep channel, clear of dangers in the fairway, between. It is low and sandy, and planted with coconut trees.

Canimeran (Kanimeran) islet lies on the southern edge of a reef, about 1½ miles north-westward of the western extremity of Pandanan island. A tree, 40 feet ($12^{m}2$) high, stands on the southern side of the islet and is an excellent landmark. Shoals, with depths of from 3 to 4 fathoms ($5^{m}5$ to $7^{m}3$) over them, extend about 2½ miles northward from the islet.

Patongong islet (*Lat. 8° 17′ N., Long. 117° 07′ E.*) lies on the south-eastern edge of a coral reef, about 2 miles westward of the western extremity of Pandanan island. Between Patongong and Canimeran islets there is a channel which is half a mile wide and clear of dangers in the fairway, which appears to be the best approach to the channel leading along the north-western side of Pandanan island.

Charts 2660b, 1263.

Chart 967.

Bugsuk island, low and flat, is separated from the eastern side of Pandanan island by a channel about 2 cables wide between the reefs extending from either side, which leads into a mass of shoals at the southern end of Coral bay. The island is densely wooded and fringed by a reef. Bugsuk river divides the island at high water, the northern entrance having a depth of 3 feet ($0^{m}9$), but the western entrance is blocked by mangroves. The southern end of the island has been cleared and planted with coconut trees.

Bowen islet, densely wooded, lies on an extensive reef about three-quarters of a mile northward of Bugsuk island. Apo, Gabung, and Byan islands lie on the reef extending about 5 miles from the south-western side of Bugsuk.

Charts 948, 967.

Bancalan island, about 3½ miles south-westward of Pandanan island, is, except on its north-eastern side, fringed by a reef, which is usually discernible by the breakers and the discoloration of the water inside it, and extends 1¾ miles from the north-western side. There are several shoals, with depths of from 2 to 5 fathoms ($3^{m}7$ to $9^{m}1$) over them, between the eastern extremity of Bancalan island and the reef which extends from the south-western extremity of Pandanan island. There are numerous coral patches, with depths of from one foot to 4¾ fathoms ($0^{m}3$ to $8^{m}7$) over them, between the south-eastern side of Bancalan island and the north-western point of Mantangule island, and there are several shoals, with depths of from less than 6 feet ($1^{m}8$) to 3¼ fathoms ($5^{m}9$) over them, between Bancalan and Patongong islet.

Patawan islet lies about 1¼ miles north-north-eastward of the eastern point of Bancalan island; it is fringed by a coral reef which extends about 2 cables from its northern and western sides. There is a channel, with a depth of 8 fathoms ($14^{m}6$), available for vessels with local knowledge, passing 2½ cables eastward of Patawan islet, leading to the deep channel southward of Patongong islet.

Chart 948.

Mantangule island lies 2¼ miles south-eastward of Bancalan island, and Canabungan (Kanabungan) island lies about 1½ miles south-south-westward of Mantangule. Malinsono island (*Lat. 8° 12′ N., Long. 117° 12′ E.*) lies about one mile northward of the north-eastern point of Mantangule island and is connected to it by a reef. All these islands are low, densely wooded, and fringed by coral and sand.

Shoals, with depths of less than 5 fathoms ($9^{m}1$) over them, lie within 3 miles of the southern side of Mantangule island and 1½ miles south-eastward of the south-eastern end of Canabungan island. The area between the two islands is foul. There is a narrow but foul channel between the eastern end of Mantangule and the reef extending from the south-western side of Bugsuk.

Chart 967.

Anchorages. — Directions. — Anchorage may be obtained by vessels with local knowledge anywhere within the area between Pandanan, Bancalan, and Mantangule islands clear of the shoals, in depths of from 7 to 15 fathoms ($12^{m}8$ to $27^{m}4$), mud and sand.

During rough weather vessels with local knowledge are recommended to anchor in the southern entrance to the channel leading between Bugsuk and Pandanan islands, or in the channel itself; it is sheltered from the sea, but it is subject to strong winds in typhoon weather.

Charts 2660b, 1263.

Chart 967.

The channels leading to the anchorages in this area are intricate, and there are strong tidal streams and tide-rips in them ; the best channel appears to be that northward of Bancalan island. The channel between the shoals extending from the northern side of the island and the reef fringing the southern side of Patongong islet is only about 3 cables wide. This channel should only be attempted when the reefs are distinctly visible.

To enter by this channel a vessel should keep well off the reef which extends 1¾ miles from the north-western side of Bancalan island, and which is always well defined ; she should steer for the southern extremity of Pandanan island, bearing 103°, until Canimeran islet opens eastward of Patongong islet, when she should steer 090° until the eastern extremity of Patongong islet bears 000°, when she should steer 037°, passing half a mile south-eastward of that islet, which will lead into the main channel north-westward of Pandanan island.

During the North-east monsoon there is a better anchorage south-eastward of Patawan islet, in depths of from 9 to 13 fathoms ($16^{m}5$ to $23^{m}8$), taking care to avoid the shoals eastward of Bancalan island and those eastward of Patawan islet. During the South-west monsoon anchorage may be obtained, in depths of from 9 to 15 fathoms ($16^{m}5$ to $27^{m}4$), mud and sand, with the eastern extremity of Patongong islet bearing 000°, distant from 1¾ to 2½ miles.

Chart 948.

North Balabac strait.—North Balabac (Balábak) strait, between Bancalan, Mantangule, and Canabungan islands on the north-east, and Secam, Ramos, and Candaraman (Kandaraman) islands on the south-west, is deep in the fairway, and has a least width between the reefs extending from Canabungan and Candaraman islands of about 2 miles. There is generally a strong current in the narrow part of the strait, depending on the monsoon.

Secam (Sekam) island, about 100 feet ($30^{m}5$) high to the tops of the trees, lies 4¼ miles south-westward of Bancalan island. It is separated from Ramos island, southward of it, by Bate channel, about 1¾ miles wide between the steep-to reefs extending from either side, and deep in the fairway. The reef on which Secam island lies extends about 1¼ miles north-westward from the western extremity of the island, with coral patches on it which dry. Depths of from 4 to 9 fathoms ($7^{m}3$ to $16^{m}5$) extend about three-quarters of a mile north-westward from the western edge of the reef.

Anchorage may be obtained off the northern side of Secam island (*Lat. 8° 11′ N., Long. 117° 01′ E.*), partially sheltered from south-westerly winds, in depths of from 19 to 20 fathoms ($34^{m}7$ to $36^{m}6$), sand and coral, about three-quarters of a mile offshore, with the eastern extremity of the island bearing 180° ; the reef westward affords protection from the swell.

In bad weather, a second anchor should be let go in time, as the squalls, which often succeed each other rapidly, are sometimes most violent.

Ramos island, the northern extremity of which is Cape Disaster, is separated from the northern end of Balabac island by Candaraman (Kandaraman) inlet, which is encumbered by islets and shoals (*see* page 102). Martin hill, 350 feet ($106^{m}7$) high, lies on the southern side of the island, and there are two small cliffy hills near the middle of the island.

Charts 2660b, 1263.

Chart 948.

The western, northern, and eastern coasts of Ramos island are low; the coastal reef, which dries, extends about one mile from the south-western side and three-quarters of a mile from the north-western side of the island. A 5-fathom ($9^{m}1$) patch lies about one mile north-eastward of Cape Disaster and 6½ cables offshore.

Candaraman island, lying on a reef which is very steep-to, about 2 miles eastward of the northern extremity of Balabac island, is low and flat. Caxisigan (Kaxisigan) island lies off the eastern entrance to Candaraman inlet, and between Candaraman island and the south-eastern end of Ramos island. A reef extends 6½ cables north-north-westward from Caxisigan island, and there are boulders and patches, with depths of from less than 6 feet to 3¾ fathoms ($1^{m}8$ to $6^{m}9$) over them, lying within 1¼ miles from the northern extremity of the island. A shoal, with a least depth of 2¾ fathoms ($5^{m}0$) over it, lies about a quarter of a mile eastward of the southern extremity of Caxisigan island.

Between the reefs extending from the western and eastern sides of Candaraman and Caxisigan islands, respectively, there is a deep channel with a least width of about 4 cables.

The fairway of the northern part of the channel between Caxisigan and Ramos islands is restricted by two detached shoals, with depths of 1¾ and 4¾ fathoms ($3^{m}2$ and $8^{m}7$) over them, situated about 9 and 5 cables, respectively, north-westward of the northern extremity of Caxisigan island. Southward of the entrance to Candaraman inlet the channel is clear of dangers and deep, and is about 3 cables wide between the reefs.

Directions.—If entering North Balabac strait northward of Secam island, a vessel should steer 142° to pass midway between it and Bancalan island, avoiding the reef which extends north-westward from Secam island, and which is usually visible; thence the same course leads in the fairway between Canabungan and Candaraman islands.

If proceeding eastward the vessel should pass about 1½ miles off the southern end of Canabungan island, or if bound southward, she should steer to pass the same distance eastward of Candaraman island.

If entering by Bate channel, she should keep towards Secam island, to avoid the 5-fathom ($9^{m}1$) patch and the edge of the reef which extends about three-quarters of a mile from Cape Disaster, and on which the sea generally breaks; thence she should steer to pass midway between Candaraman and Canabungan islands.

Tidal streams.—Currents.—During spring tides violent whirlpools and overfalls are met in the northern part of the channel between Caxisigan and Ramos islands. Currents in the vicinity of Encampment point, situated 1½ miles south-eastward of Cape Disaster (*Lat. 8° 08′ N., Long. 117° 02′ E.*), have a rate of 2½ knots and may attain 4 knots.

Candaraman inlet.—Dangers.—Candaraman inlet, entered from eastward between Andeyro point, the north-eastern extremity of Balabac island, and Marinas point, the south-eastern extremity of Ramos island, is almost blocked by coral reefs, but there are deep narrow channels, through which strong tidal streams flow; heavy whirlpools and eddies are formed during spring tides.

Good anchorage may be obtained by vessels with local knowledge in Candaraman inlet, eastward or westward of Albay island, situated about 1½ miles from Andeyro point, in depths of from 4 to 7 fathoms ($7^{m}3$ to $12^{m}8$), mud.

Charts 967, 2660b, 1263.

Chart 948.

In entering from westward a vessel should follow the edge of the reef extending from the south-western side of Ramos island, and pass northward of Sanz island, situated in the western entrance to Candaraman inlet. The reefs are easily seen with a rising tide and at high water, but with a falling tide and at low water they are often obscured by mud from the numerous mangrove inlets.

For Port Ciego, at the western entrance to the inlet, *see* page 105.

BALABAC ISLAND.—Aspect.—Balabac (Balábak) island, lying 17 miles south-south-westward of Cape Buliluyan (*Lat.* 8° *20′ N., Long. 117° 12′ E.*), is thickly wooded. On the northern part of the island are several detached hills, the highest of which has an elevation of 735 feet (224^{m}0). On the southern half of the island are several ranges of high hills ; only a few, however, are of sufficient importance to require description. Steepfall range, about 2½ miles northward of Cape Melville, the southern extremity of the island, is composed of several hills from about 800 to 950 feet (243^{m}8 to 289^{m}6) high, presenting a table-topped appearance ; the sides of these hills are steep. Northward of Steepfall, other ranges, varying in elevation from about 800 to 1,400 feet (243^{m}8 to 426^{m}7), extend to Dàlawan bay ; Balabac (Balábak) peak, 1,867 feet (569^{m}0) high, situated 7¾ miles north-north-eastward of Cape Melville, is the summit of the island. (*See* view on chart 948 and views facing page 91). Farther northward other ranges extend as far as Calandorang bay.

Eastern side of Balabac island.—Current.—The east coast of Balabac island between Andeyro point and Cape Melville, is generally bold, and steep-to in most places.

It is reported that there is a weak south-going current close off the east coast of Balabac island.

Caboang bay.—Caboang bay, entered 3¾ miles southward of Andeyro point, is 3 cables wide at its entrance, but the navigable channel is reduced to three-quarters of a cable by drying reefs which extend from both entrance points. The shores are bordered with mangroves and backed by wooded hills. A coral reef, which dries, extends about 2½ cables east-north-eastward from the south-western corner of the bay. Small vessels with local knowledge may obtain anchorage in the north-western corner, in a depth of about 9 fathoms (16^{m}5), mud.

Chart 966, plan of Kalándórang bay.

Calandorang bay.—Light.—Calandorang (Kalandorang) bay is entered between Sarmiento point, situated 4½ miles southward of Andeyro point, and Espina point, about 6 cables farther southward. Sarmiento point consists of mangrove with hilly ground a short distance inland. Espina point is dominated by Almirante Gil hill, 105 feet (32^{m}0) high. Coral reefs, which dry, with shallow water beyond, extend about one cable off both points, and for a greater distance off the points within on the northern shore, which consists entirely of mangrove. Off the town of Balabac there are depths of from 1½ to 2¾ fathoms (2^{m}7 to 5^{m}0), and there are depths of less than 5 fathoms (9^{m}1) nearly one mile from the head of the bay.

The town of Balabac (Balábak) is situated on the southern side of the bay, about 6 cables within the entrance. There is a landing pier for small boats at the town, with a depth of 4 feet (1^{m}2) at its head.

Chart 966, plan of Kalándórang bay.

A light is exhibited, at an elevation of 133 feet (40$^{\text{m}}$5), from a white concrete tower, with dwelling, on Espina point.

Anchorage.—Directions.—Anchorage may be obtained, in a depth of about 8 fathoms (14$^{\text{m}}$6), with Espina point bearing 109°. Small vessels may go farther in on a line of bearing of the bluff, situated about three-quarters of a mile west-south-westward of Espina point. The anchorage is good, with a mud bottom, and perfectly secure in the South-west monsoon. During the North-east monsoon the wind occasionally blows into the bay with some force and raises a choppy sea, so that vessels should then anchor nearer the northern shore.

Gading river, which flows into the western part of the bay, is reported to afford a perfectly-protected anchorage for small vessels with local knowledge of from 90 to 100 feet (27$^{\text{m}}$4 to 30$^{\text{m}}$5) in length. The channel had a depth of 3 feet (0$^{\text{m}}$9), in 1933, and was sometimes marked by stakes.

Vessels should approach the bay midway between the entrance points, and when Espina point lighthouse (*Lat. 8° 00′ N., Long. 117° 04′ E.*) bears 159°, should steer for the bluff westward of the town, bearing 233°, proceeding slowly, as the depths decrease rapidly within the 10-fathom (18$^{\text{m}}$3) line.

A radio mast, about 5 cables southward of Espina point lighthouse, is prominent when approaching from eastward.

Chart 966, plan of Daláwan bay.

Dalawan bay.—Dangers.—Dalawan bay, entered southward of Minagas point, 5½ miles southward of Espina point, affords good shelter during the South-west monsoon ; it may be identified by the low land extending in a west-north-westerly direction from the beach across the island, separating the high land in the vicinity of Balabac peak from Transept hill, a smooth table-topped hill, 1,319 feet (402$^{\text{m}}$0) high, 2½ miles southward.

The bay is about 1¼ miles wide between the entrance points, which are fringed with mangrove. Reefs, which dry, extend from both points, and with the shoal water outside them contract the channel to a width of about 6 cables ; the reef on the northern side has a rock at its extremity named Buoy rock, lying 2 cables southward of the point, and which, from being generally uncovered, is an excellent mark when entering the bay. The spit on the southern side dries for 1½ cables offshore, but a rocky spit with depths of less than 5 fathoms (9$^{\text{m}}$1) over it, extends 3½ cables beyond this in an east-north-easterly direction, having in some parts a depth of only 3 feet (0$^{\text{m}}$9) over it, with 5 and 7 fathoms (9$^{\text{m}}$1 and 12$^{\text{m}}$8) close to the edge.

The shores of the bay are densely wooded. In the south-western corner are two white rocks, the eastern of which is the more prominent. About 2½ cables north-north-westward of these rocks Dalawan river discharges, but its channel is constantly shifting and boats can only enter at high water. A coral reef lies about 2½ cables eastward of the river mouth, and a shoal lies about 1¾ cables southward of the reef.

The best anchorage is nearly in the middle of the bay, in a depth of 9 fathoms (16$^{\text{m}}$5), mud, about half a mile offshore.

Chart 966, plan of Clarendon bay.

Clarendon bay.—Clarendon bay is entered close north-eastward of Cape Melville. It is 3½ cables wide at its entrance between Inanacule

Charts 967, 2660b, 1263.

Chart 966, plan of Clarendon bay.

and Barong Barong (West) points, the northern and southern points, respectively. The navigable channel, however, is reduced to about a quarter of a cable between the reefs on either side. The bay is of no commercial importance, and is only used by the lighthouse tender.

The head of the bay is reported to be foul.

Vessels should enter the bay with the middle of the entrance bearing 321°, thence steer for the anchorage about 4½ cables northward of Barong Barong point, and anchor in a depth of 4½ or 5 fathoms ($8^{m}2$ or $9^{m}1$).

Chart 948.

Western side of Balabac island.—Port Ciego.—Port Ciego, at the western end of Candaraman inlet, is entered between Paz islet, situated close off the western extremity of Ramos island, and Martinez point, about 2 miles south-westward.

Dangers.—The western coasts of Ramos and Balabac islands are fronted by numerous dangers, the most important of which are North-west shoal, Ada reef, Western shoals, Balabac Great reefs, South-western banks and Gnat reef.

North-west shoal, with a least depth of 2 fathoms ($3^{m}7$) over it, lies off the western side of Ramos island, leaving a deep channel about one mile wide between the coral reef fringing the island and the 10-fathom ($18^{m}3$) line surrounding the shoal.

Ada reef, which dries, lies with its eastern extremity about 1¾ miles westward of Martinez point, with foul ground between. A 4-fathom ($7^{m}3$) patch lies about 7½ miles westward of Martinez point.

Balabac (Balábak) Great reefs, which dry, extend from about 2 to 5 miles from the western side of Balabac island.

There is a channel between Balabac Great reefs and the island, about half a cable wide in its narrowest part south-westward of Ligas (West) point, the western extremity of the island; this point shows distinctly when seen from north-westward and south-westward. There are numerous dangers in this channel, and no vessel without local knowledge should use it.

Western shoals, with a least depth of 2¼ fathoms ($4^{m}1$) over them, lie parallel with Balabac Great reefs at a distance of about 2½ miles, with a deep passage between, but there are several shoals, with depths of from 3½ to 5 fathoms ($6^{m}4$ to $9^{m}1$) over them, in it. Several shoals, with depths of from 5½ to 6¾ fathoms ($10^{m}1$ to $12^{m}3$) over them, lie within 5¾ miles of the outer edge of Balabac Great reefs.

South-western bank, with a least depth of 3¾ fathoms ($6^{m}9$) over it, lies about 2 miles south-westward and southward of the southern end of Balabac Great reefs.

In 1932, a prominent wreck with hull showing, lay near the south-eastern end of South-western bank, about 4¼ miles west-south-westward of Cape Melville lighthouse (*Lat. 7° 49′ N., Long. 117° 00′ E.*).

Gnat reef, which dries in the middle, lies about one mile south-eastward of the southern end of Balabac Great reefs, with a channel in which there are several detached reefs, about half a mile wide between them. This channel leads to the anchorage about 2 miles southward of Ligas point

Cape Melville.—Light.—Cape Melville, the southern extremity of Balabac island, is fringed by a reef, which extends half a mile offshore,

Charts 967, 2660b, 1263.

Chart 948.

and, between it and the point about 2 miles west-north-westward of it, there are detached patches lying within 1¼ miles of the coast.

A light is exhibited, at an elevation of 296 feet (90^{m}2), from a yellow octagonal masonry tower, with dwelling, about 1½ miles north-westward of Cape Melville.

Tidal streams.—The tidal streams off the western and south-western sides of Balabac island follow the general direction of the edges of the reefs and run at a rate of from about one to 1½ knots.

Directions.—Caution.—If coming from southward on the western side of Balabac island, a vessel should not approach Balabac island nearer than 12 miles until Balabac peak bears more than 120°, or until Martin hill bears 092°, when she should steer for Secam island, bearing 070°.

When approaching the dangers off-lying the west coast of Balabac in the afternoon, when the sun will be astern, the outer shoals, and also the reefs will generally be seen in sufficient time to avoid them; but if the sun be ahead, the outer shoals are difficult to make out until close to them. The soundings are so variable and uncertain in depths of less than 30 fathoms (54^{m}9) as to afford little assistance. A good lookout is therefore of the first importance. At night, vessels should not approach into a depth of less than 40 fathoms (73^{m}2) off the south-western and western parts of the island, nor get into less than 50 fathoms (91^{m}4) off the north-western part.

CHANNELS EASTWARD OF BALABAC ISLAND.—North channel.—Danger.—North channel has a least width of about 4½ miles between the reefs extending from the south-eastern end of Canabungan island, and the northern extremity of Nasubata reef southward of it.

Nasubata island is a cleft rock of sandstone formation, 90 feet (27^{m}4) high, and wooded, lying at the northern end of Nasubata reef, which dries and is steep-to, about 5 miles eastward of Sarmiento point.

Roughton islet, about 3 miles eastward of Nasubata island, is a wooded sand cay situated on the north-western part of Roughton reef, which is steep-to except on the north-eastern side, from which a bank, with depths of less than 5 fathoms (9^{m}1) over it, extends about 7 cables from the edge of the reef. Three-quarters of a mile northward of the eastern point of the reef is a 2¼-fathom (4^{m}1) patch. The channel between Roughton reef and Nasubata reef is 1¼ miles wide, with depths of about 100 fathoms (182^{m}9) in the middle.

During the strength of the monsoon the tidal stream in conjunction with the current attains a considerable rate, and must be guarded against.

Nasubata channel.—Nasubata channel is 4¾ miles wide between Roughton reef and Comiran (Komiran) Danger bank, southward of it, and is deep in the fairway. In navigating this channel it is only necessary to guard against the effects of the tidal stream, which, when combined with the current, sweeps through it in the direction of North Balabac strait at a considerable rate at times.

Comiran (Komiran) island (*Lat. 7° 55′ N., Long. 117° 13′ E.*), about 6 miles southward of Roughton islet, is wooded and lies on the north-western side of Comiran Danger bank; it is fringed by a reef which extends from one to 2 cables offshore. In 1946, the reef at the east-

Charts 967, 2660b, 1263.

Chart 948.

north-eastern extremity of the island was reported to extend about three-quarters of a mile offshore. Turtle resort here at times in great numbers.

A shoal, with a least depth of 1¼ fathoms (2^{m}3) over it, lies at the south-western end of Comiran Danger bank, about a mile south-westward of Comiran island, and a shoal, with a least depth of 2¾ fathoms (5^{m}0) over it, lies at the eastern end of the same bank, about the same distance eastward of the island; both shoals are fairly steep-to.

Comiran channel.—Dangers.—Comiran (Komiran) channel is about 2¾ miles wide between Comiran Danger bank and the northern edge of Lumbucan (Lumbukan) Danger bank, southward of it. Near the middle of the channel is a shoal, with a least depth of 4¾ fathoms (8^{m}7) over it; about 1¾ miles south-south-eastward of Comiran island there is a 6-fathom (11^{m}0) patch and about 1½ miles north-north-eastward of Lumbucan island there is a 5¼-fathom (9^{m}6) patch; except for these shoals Comiran channel is deep; it is, however, not recommended, as there are other and better channels in the vicinity.

Lumbucan (Lumbukan) island, 100 feet (30^{m}5) high, and wooded, lies on the southern side of Comiran channel, about 5 miles southward of Comiran island. It is fringed by a reef which extends about 1½ miles west-south-westward and about three-quarters of a mile east-south-eastward. A sand cay lies on the reef about 4 cables westward of the island.

From 2 to 3¼ miles north-eastward of Lumbucan island is North-east shoal, with depths of from 1¾ to 3 fathoms (3^{m}2 to 5^{m}5) over it. From 1½ to 2¾ miles eastward of the island are two shoals, with depths of from 3 to 5 fathoms (5^{m}5 to 9^{m}1) over them. South shoal, with a least depth of 1¼ fathoms (2^{m}3) over it, lies about 1¼ miles southward of Lumbucan island. The island and these dangers all lie on Lumbucan Danger bank. The bank was reported, in 1935, to have extended eastward.

Chart 967.

Outlying danger.—Viola reef, a coral patch, with a depth of 4 feet (1^{m}2) over it, on which the Spanish vessel of that name struck, was reported to lie about 25 miles eastward of Lumbucan Danger bank, in lat. 7° 50′ N., long. 117° 41′ E. This locality was searched by H.M.S. *Nassau* in 1872, when no indication of shoal water was found. A danger, the position of which is doubtful, is charted 4 miles farther northward; this was not seen by the U.S.S. *General Alava*, in November, 1901, on that vessel passing 1¼ miles from its charted position.

Chart 948.

BALABAC STRAIT.—Balabac (Balabak) strait, leading from the China sea into the Sulu sea, lies between Balabac island on the north and Balambangan and Banguey islands on the south.

The greater part of this strait is encumbered by numerous coral dangers divided into groups, each group being distinguished by a special denomination—such as Great Danger bank (*Lat. 7° 38′ N., Long. 117° 19′ E.*), Mangsi Danger bank, &c. This arrangement distinctly defines the limits of the various channels, between the dangers.

Balabac and Banguey peaks are the most prominent objects in the vicinity of the strait, and are most useful for determining the position

Charts 2660b, 1263.

Chart 948.

of vessels when navigating this strait, especially for those bound eastward.

Tidal streams.—Current.—The strength of the tidal stream or of the current depends greatly on the prevailing winds. The greatest rate observed was 2½ knots. For current, *see* page 10.

In the months of October and November, 1844, after a succession of westerly winds, the current was found to set constantly eastward, slackening only on the west-going tidal stream; while in July, after a continuance of unusually fine weather with light easterly and south-easterly winds, it set with the same strength, viz., from three-quarters to 2½ knots in the opposite direction. The mean rate observed for 13 consecutive hours was 1¾ knots.

Dangerous area.—There is a dangerous area, due to mines, the limits of which are indicated in pecked lines on the chart, northward of Banguey island. Both Mangsi and Main channels lie in this area, which is expected to remain dangerous until the end of 1951.

Lumbucan channel.—Dangers.—Lumbucan (Lumbukan) channel, between Lumbucan Danger bank on the north, and Ellis shoal and Simanahan reef on the south, is from 4 to 5 miles wide, and is deep in the fairway except for a 6¾-fathom ($12^{m}3$) patch and a bank, with a least depth of 7½ fathoms ($13^{m}7$) over it, situated about 3¼ and 2¾ miles, respectively, southward of Lumbucan island, and Doorly patches, with a least depth of 6 fathoms ($11^{m}0$) over it, lying in the middle of the eastern end of the channel; these banks are steep-to.

In 1935, Lumbucan Danger bank was reported to extend farther eastward than is shown on the chart.

Ellis shoal, with a least depth of 1¾ fathoms ($3^{m}2$) over it, coral, lies 6½ miles south-south-westward of Lumbucan island.

Simanahan reef, about 7 miles south-eastward of Lumbucan island, is situated near the middle of a coral bank, and dries over a length of about one mile east and west, with a sandbank near its centre, which dries about 4 feet ($1^{m}2$).

Simanahan channel.—Simanahan channel, between Simanahan reef and Great Danger bank, southward of it, is about 1½ miles wide and deep in the fairway. Vessels using this channel should keep in the fairway and steer 090° or 270°, avoiding Ellis shoal.

Great Danger bank, separating Simanahan channel from Middle channel, comprises many reefs, amongst which no vessel should venture. North patches, with a least depth of 3½ fathoms ($6^{m}4$) over it, lie near the northern edge of the bank. North-west shoals, with depths of from 1½ to 3 fathoms ($2^{m}7$ to $5^{m}5$) over them, lie at the north-western end of the bank. Middle shoals are a group of coral patches, with a least depth of 2 fathoms ($3^{m}7$) over them, occupying the middle of the bank. A sand cay, the only part of Great Danger bank above water, lies near the south-eastern end on a narrow coral reef, with depths of from 3¼ to 4 fathoms ($5^{m}9$ to $7^{m}3$) between it and Middle shoals. South-east shoals (*Lat. 7° 35′ N., Long. 117° 26′ E.*) comprise several coral patches situated near the south-eastern extremity of the bank, with depths of from 1¾ to 4½ fathoms ($3^{m}2$ to $8^{m}2$) over them.

Chart 967.

Outlying shoals.—In 1907 s.s. *Borneo* passed over a patch of discoloured water about 15½ miles east-north-eastward of the sand cay on Great Danger bank; the coral bottom was plainly visible,

Charts 2660b, 1263.

Chart 967.

and a least depth of 7 fathoms ($12^{m}8$) was obtained. The shoal, which is known as the Borneo bank, was not examined, so there may be a less depth over it.

A shoal, with a depth of 7 fathoms ($12^{m}8$) over it, and a shoal, with an estimated depth of from 5 to 6 fathoms ($9^{m}1$ to $11^{m}0$) over it, reported by s.s. *Lompoc*, in 1927, lie about 2 miles eastward and 5½ miles east-south-eastward, respectively, of the charted position of Borneo bank.

A shoal, with a depth of 7 fathoms ($12^{m}8$) over it, lies about 17 miles east-south-eastward of the sand cay on Great Danger bank.

Chart 948.

Middle channel.—Middle channel, separating Great Danger bank from Mangsi Danger bank, has a least width of one mile, and is deep in the fairway.

Ray bank, with a least known depth of 3 fathoms ($5^{m}5$), sand and coral, over it, lies on the northern side of the western approach to Middle channel, and about 6 miles westward of North-west shoals on Great Danger bank.

Mangsi Danger bank includes within its limits Salingsingan and Mangsi islands, with the extensive adjacent dangers, also Loxdale, Jessie, and many smaller shoals. Loxdale shoal, with a least depth of 2¼ fathoms ($4^{m}1$) over it, and fairly steep-to, lies at the western end of Mangsi Danger bank. Salingsingan island, situated in the middle of the northern side of Mangsi Danger bank, is composed of sand and coral, and is covered with trees. A bank, nearly awash in places, extends three-quarters of a mile eastward and 1¾ miles westward from the island. Jessie shoal, with a least depth of one fathom ($1^{m}8$) over it, lies about 2½ miles east-south-eastward of Salingsingan island, and at the eastern end of Mangsi Danger bank.

Directions.—Middle channel lies out of the usual track of vessels, but may be used if necessary. From a position about 3 miles southward of Ray bank a vessel should steer 103° until abeam of Salingsingan island, when she should steer 112°, which will lead through the fairway.

Mangsi channel.—Mangsi channel, separating Mangsi Danger bank from Mangsi Great reef, is one mile wide at its narrowest part, where the depths are irregular, but it is deep throughout the fairway; the reefs on the northern side are steep-to, but on the southern side are less so.

North Mangsi island, 2 miles southward of Salingsingan island, and on the northern side of Mangsi channel, is 130 feet ($39^{m}6$) high, and wooded. Reefs and shoals extend 2¼ miles east-south-eastward and 3¼ miles west-north-westward from the island. A sand cay, visible at low water, lies near the eastern extremity of these reefs, about 1¾ miles east-south-eastward of North Mangsi island. A 4-fathom ($7^{m}3$) patch lies one mile northward and another with the same depth about 2¾ miles eastward of the island.

South Mangsi island (*Lat. 7° 31′ N., Long. 117° 19′ E.*), wooded and fringed by a reef which extends one mile eastward, lies about 6 cables south-south-eastward of North Mangsi island.

Mangsi Great reef, on the southern side of Mangsi channel, dries 4 feet ($1^{m}2$) nearly everywhere, but there is usually a sand cay on some part of the reef above the level of high water. At low water the reef presents a vast expanse of coral and sand, with lagoons in places. From the western end of the reef depths of from 4 to 10 fathoms (7m3 to 18m3) extend about 2 miles west-south-westward.

Directions.—(*See* Dangerous area, page 108.)—Vessels will rarely have occasion to use this channel, but in case of necessity the following directions may be of assistance; with a proper lookout, no difficulty will be found in passing safely through. Approaching from westward, and having sighted the Mangsi islands, a vessel should steer for South Mangsi island, bearing 103°, and when the western end of North Mangsi bears 069° she should steer 137°, passing midway between the Mangsi islands and Mangsi Great reef.

Outlying dangers.—Kestrel rock, about 5½ miles south-eastward of South Mangsi island, was reported by H.M.S. *Kestrel*, in 1879, to have a depth of 5 fathoms (9m1) over it, but a depth of 3½ fathoms (6m4) has since been obtained.

In 1882, H.M.S. *Comus* obtained a depth of 8 fathoms (14m6) about one mile southward of Kestrel rock. Caution should be exercised when in this neighbourhood.

A group of rocks awash, was reported in 1899, to lie about 6 miles eastward of Kestrel rock, but its position is doubtful. The Master of the s.s. *Selangor* reported, in 1922, that he had often passed close to the position of these rocks in all states of weather and had never seen any indication of them.

Main channel.—Main channel, between Mangsi Great reef and Banguey island, is 5½ miles wide, but the navigable width is reduced to 1½ miles between the 10-fathom (18m3) lines on either side. Vessels from south-westward and bound through Balabac strait during the North-east monsoon will find this channel the most convenient.

Balambangan island. — Dangers. — Balambangan island, situated 27 miles southward of Balabac island, and on the southern side of Balabac strait, is 440 feet (134m1) high near its southern end. Thumb peak, 314 feet (95m7) high near the south-western extremity of the island, is prominent; these elevations are terminated on the coast-line by steep cliffs. The northern portion of the island is flat and densely wooded with high trees. *See* view facing page 118. The island is a British possession.

A bank, on which there are depths of less than 6 fathoms (11m0), and reefs extend nearly one mile northward and westward from Siagut point, the northern extremity of Balambangan island, and a 3-fathom (5m5) patch lies nearly 1¼ miles north-north-westward of the point.

Siagut shoal, the north-eastern end of which lies 1½ miles westward of Siagut point, is a detached coral bank, with one head awash, and with depths of one fathom (1m8) over other parts of it.

In the large bight south-westward of Siagut point, the shore bank, with depths of less than 3 fathoms (5m5) over it, extends about 1½ miles offshore, and southward of Point Buttun, about 8 miles south-westward of Siagut point, the reef extends nearly three-quarters of a mile.

Kalutan point (*Lat. 7° 12′ N., Long. 116° 52′ E.*), the southern extremity of Balambangan island, is fringed by several islets and rocks which extend three-quarters of a mile south-eastward. About half a mile eastward of these is a coral patch, with a depth of 3 fathoms (5m5) over it.

Kalutan island, 278 feet (84m7) high, lies about one mile north-

Chart 948.

westward of Kalutan point and half a mile offshore; a reef extends nearly half a mile from the western side of the island.

The whole of the east coast of Balambangan is fringed by a coral reef, outside which are detached patches, which dry, but the 3-fathom (5^{m}5) line embracing these is, for the most part, distant half a mile offshore. About 1½ miles south-eastward of Siagut point, and separated from the coastal reef by a narrow passage, lies a coral shoal with a depth of less than 6 feet (1^{m}8) over some parts of it; eastward of this danger, in the channel between it and the reef surrounding Tiga islet, is a shoal with a depth of 3½ fathoms (6^{m}4) over it and another with 2½ fathoms (4^{m}6) over it; caution is therefore necessary when passing through this channel.

The shoals off the south-eastern coast are not easily discerned unless the sun is shining behind the observer. A reef extends 1½ miles southward from Saparoak point, 8 miles north-eastward of Kalutan point.

Chart 966, plan of Luk Barábok Barábok or North harbour.

Luk Barábok Barábok.—Dangers.—Luk Barábok Barábok or North harbour is situated on the south-eastern side of Balambangan island, and is entered between Saparoak point and Battang point, about 2¾ miles north-eastward. Foul ground extends about 4 cables southward from Battang point, and there are several reefs in the entrance, the positions of which can be seen on the chart. A 1½-fathom (2^{m}7) patch lies about three-quarters of a mile west-south-westward of Battang point, and a reef, awash, lies 3½ cables north-westward of the patch.

The head of the harbour is known as Lung bay, and is encumbered with several shoals.

Anchorage.—Directions.—Anchorage may be obtained, in a depth of 10 fathoms (18^{m}3), with the centre of the reef awash, mentioned above, in line with Battang point, bearing about 083°, and Saparoak point, 204°.

It is inadvisable to enter the harbour unless the reefs are visible from aloft.

Charts 966, plan of Luk Barábok Barábok or North harbour, 948.

A vessel approaching from south-westward, should keep Kalutan point bearing more than 261°, to pass southward of Half Channel patch, which lies 2 miles south-eastward of Saparoak point, has a depth of 3 feet (0^{m}9) over it and breaks at times. When Manyangit point, the north-western extremity of Banguey island, bears 024°, she should steer for it on that bearing until Battang point bears about 322°, when she should steer to pass between the latter point and a reef awash about one mile south-south-westward of it, taking care to avoid the 1½-fathom (2^{m}7) patch three-quarters of a mile west-south-westward of the same point.

Chart 966, plan of South harbour.

South harbour.—South harbour, situated on the eastern side of the southern extremity of Balambangan island, is fronted by shoals which lie within 2 miles of the entrance points; reefs extend from both entrance points, that extending from Raha point (*Lat. 7° 13′ N., Long. 116° 54′ E.*), the southern entrance point, being named Raha reef; the positions of these and the other off-lying reefs can best be seen on the chart. The depths in the fairway, which is about 2¼ cables wide, are from 7 to 11 fathoms (12^{m}8 to 20^{m}1).

Charts 287, 967, 2660b, 1263.

Charts 966, plan of South harbour, 948.

Anchorage.—Directions.—Anchorage may be obtained, in a depth of 7 fathoms ($12^{m}8$), in the fairway about a quarter of a mile north-westward of the north-eastern extremity of Raha point, and 1¾ cables from the southern shore.

To enter South harbour requires close attention to the following directions, and it is inadvisable to enter unless the reefs are visible from aloft. A vessel approaching from south-westward, having given Kalutan point a berth of at least one mile, should alter course north-eastward, passing south-eastward of the 3-fathom ($5^{m}5$) patch, situated half a mile eastward of Cone islet, the outer of the islets extending south-eastward from Kalutan point. She should keep Cone islet bearing not less than 252°, well open of the islets off Observatory point, which leads southward of the reefs south-eastward of Raha point; when Raha point bears 319°, she should alter course to 000°, passing between Raha reef, the edge of which may be seen from aloft and probably marked by breakers, and the detached reef with a depth of less than 6 feet ($1^{m}8$) over it, lying about a quarter of a mile eastward; thence she should round Raha reef at a prudent distance and steer about 260° for the anchorage.

Chart 948.

Banguey West channel.—Banguey West channel, separating Balambangan and Banguey islands, is about 2¼ miles wide between Battang and Manyangit points. The southern part is deep. Half Channel patch lies nearly in the fairway, but the channel eastward of it is 2½ miles wide.

The northern entrance, between Siagut point and Samarang point, 8½ miles eastward, is encumbered by Tiga islet and the reef on which it lies, and by Rifleman rock and other shoals. The channel between Rifleman rock and Tiga islet has depths of from 6 to 7 fathoms ($11^{m}0$ to $12^{m}8$) in the fairway, but it would not be safe to reckon on more than 5 fathoms ($9^{m}1$) unless the channel were thoroughly buoyed. The channel along the Banguey shore appears to be good, if buoyed; the channel westward of Tiga is narrower and more encumbered with shoals; these two channels should only be navigated when the dangers are discernible.

Dangers.—Beacon.—Tiga islet, low and wooded, is surrounded by a reef which is fairly steep-to, and which extends about one mile northward and south-eastward; the south-eastern extremity of the reef is marked by an iron tripod beacon painted, in black and white horizontal bands, surmounted by a black cone, but it should not be depended on.

For the shoal and patches westward of Tiga islet, *see* page 111.

Rifleman rock, with a depth of 1½ fathoms ($2^{m}7$) over it, is a small coral patch lying on the western edge of a bank, 1¾ miles east-south-eastward of Tiga islet; on this bank there are depths of from 2½ to 5 fathoms ($4^{m}6$ to $9^{m}1$), and between it and the north-western coast of Banguey island from 5 to 8 fathoms ($9^{m}1$ to $14^{m}6$).

Labuan rock, with a depth of 1½ fathoms ($2^{m}7$) over it, lies in the fairway about one mile northward of Manyangit point (*Lat. 7° 18′ N., Long. 117° 04′ E.*).

On the reef extending about three-quarters of a mile north-westward from Samarang point there is a sand cay about 2 cables within its extremity. About 2 miles south-westward there is an islet on the

Charts, 287, 967, 2660b, 1263.

Chart 948.

reef fringing the coast. Thence to Manyangit point the reef fringing the coast and foul ground extends not more than 5 cables offshore.

Directions.—A vessel approaching Banguey West channel from northward, should pass between Rifleman rock and the beacon south-eastward of Tiga islet and westward of Labuan rock, thence half a mile westward of Manyangit point, thence along the Banguey side at a distance of from one to 1½ miles until southward of Half Channel patch, when course may be shaped westward as requisite.

Banguey island.—Banguey island, a British possession, is fringed by a reef, the south-eastern coast being fronted by several smaller islands with deep channels between them; these islands are described with Banguey South channel. Off the north-eastern side of the island there are numerous islets and dangers which lie within 5½ miles of the coast, and on the southern side of Main channel.

Aspect.—There are several ranges, also some detached hills, on Banguey island; the highest, Banguey peak (*Lat. 7° 18′ N., Long. 117° 05′ E.*), 1,876 feet ($571^{m}8$) high, is at the north-western end of the island, and is very prominent. Viewed on a north-easterly or opposite bearing, the apex appears as a nipple, but as this line of bearing is departed from, the nipple shape becomes less apparent and the summit assumes a rounded form. A range of hills extends eastward for a distance of 6 miles, with East hill at the extremity, 1,076 feet ($328^{m}0$) high; thence some smaller ranges lie in a northerly direction, and terminate near the coast in North hill, 742 feet ($226^{m}2$) high. About 1¼ miles south-eastward of Banguey peak is a prominent summit 1,480 feet ($451^{m}1$) high. The island is thickly wooded.

Southern side of Main channel. — Islets and dangers. — Between Samarang point and the northern extremity of Banguey the coast forms two bays, each having a small stream running into it; the points and the sides of the western bay are fringed with coral extending from one to 2 cables offshore, but the head of it is a coral and sand beach; vessels may obtain anchorage in the entrance of the bay in a depth of 4 fathoms ($7^{m}3$). The eastern bay, with the exception of a narrow boat passage, is blocked with coral, on the outer part of which is a small islet.

North Guhuan islet lies on a reef about 8 cables northward of the northern extremity of Banguey. A bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends 4 miles eastward from North Guhuan islet, parallel with the coast, and near its eastern end are two sand cays and reefs which dry.

Louisa shoal, composed of coral, with a depth of 1½ fathoms ($2^{m}7$) over it, lies about 1¼ miles north-north-eastward of North Guhuan islet. Two 5-fathom ($9^{m}1$) patches lie about 1¼ miles northward of Louisa shoal. Manyangit point well open of Samarang point, leads north-westward of Louisa shoal.

Maggie reef, on which there is a coral reef, which dries, on its northern side and several sunken rocks, lies about 4 miles east-north-eastward of North Guhuan islet. About half a mile northward of the line joining the northern edges of Louisa shoal and Maggie reef are two 3½-fathom ($6^{m}4$) patches.

Black Watch rock, on which the British barque *Black Watch* is reported to have struck, in 1878, lies about 2 miles northward of Maggie reef.

Charts 287, 967, 2660b, 1263.

Chart 948.

From the position of this rock, as given by the master of the *Black Watch,* North Mangsi island was open westward of South Mangsi island, bearing 010°, and the cay on Banguey Outer N.E. reefs, 127°. The position is, however, doubtful. At half a mile eastward of the assigned position of the rock the depth is 5½ fathoms (10^{m}1).

From the irregularity of the soundings near this suspected locality it is possible that coral heads may exist other than those shown on the chart.

East Guhuan islet (*Lat. 7° 22′ N., Long. 117° 20′ E.*), 5½ miles eastward of North Guhuan islet, lies on the western side of a coral reef, the northern part of which dries. About one mile north-north-westward of East Guhuan islet is a 1½-fathom (2^{m}7) patch.

Banguey Outer N.E. reefs are a group of reefs separated from Maggie reef and East Guhuan islet by a channel one mile wide, with depths of from 7 to 9 fathoms (12^{m}8 to 16^{m}5) in the fairway. A large part in the middle of Banguey Outer N.E. reefs dries, and at the north-western end is a sand cay which lies about 4¾ miles from the north-eastern point of Banguey. Close to the edges of these reefs there are depths of from 6 to 9 fathoms (11^{m}0 to 16^{m}5).

The south-western extremity of South Mangsi island in line with the western extremity of North Mangsi island, bearing 327°, leads close north-eastward of Banguey Outer N.E. reefs.

Outlying dangers.—Borneo shoal, with a depth of about 2 fathoms (3^{m}7) over it, lies 12½ miles eastward of East Guhuan islet. A shoal, with a depth of 4 fathoms (7^{m}3) over it, lies about 3¼ miles southward of Borneo shoal.

Chart 967.

A shoal, with a depth of 3¼ fathoms (5^{m}9) over it, lies about 3¼ miles south-eastward of Borneo shoal. Fearless shoal, with a depth of 4 fathoms (7^{m}3) over it, lies 5 miles east-north-eastward of Borneo shoal.

The vicinity of these shoals has not been thoroughly examined.

Chart 948.

Directions for Main channel.—(*See* Dangerous area, page 108.)—A vessel approaching from south-westward, and bound through Balabac strait, during the North-east monsoon, will find Main channel the most convenient. When approaching the northern end of Balambangan island, she should not bring Point Buttun to bear more than 221°, nor come into a depth of less than 14 fathoms (25^{m}6), until North hill, on Banguey island, bears 109°, which latter bearing leads over one mile outside the dangers off Siagut point, and of those extending northward from Tiga islet.

From a position about 2½ miles northward of Siagut point, the vessel should steer about 080°, which will lead about three-quarters of a mile southward of Mangsi Great reef. The northern edge of the shoals on the southern side of the fairway is shown on the chart by a pecked line, southward of which vessels should not go.

The light green colour of the water over Mangsi Great reef will, even at high water, enable the edge to be made out from aloft sufficiently far off to permit of a vessel proceeding past it at a safe distance. Thence she should steer to pass about 2 miles southward of South Mangsi island, and the same distance northward of Kestrel rock, when course may be altered as necessary.

Charts 287, 2660b, 1283.

Charts 948, 967.

If proceeding to Sandakan, after passing the area with irregular depths extending 30 miles eastward from Banguey island (*see* page 119), she should steer towards Muligi islands (page 74) so as to make them bearing 137°.

Coming from the Sulu sea, the vessel should steer for South Mangsi island, bearing about 272°, thence steer to pass 2 miles southward of it, and when it is abeam she should steer about 249° for the entrance of Main channel.

Chart 948.

ISLANDS AND DANGERS EASTWARD OF BANGUEY ISLAND.—The east coast of Banguey island is fronted by dangers which extend off several miles; they consist mostly of extensive reefs, which dry, separated from each other by narrow channels.

Kahamkamman islet lies on the north-western end of a coral reef, which dries, 2 miles south-eastward of East Guhuan islet.

Samson patches are three patches, with depths of from 3½ to 4 fathoms (6$^{\text{m}}$4 to 7$^{\text{m}}$3) over them, lying about 2 miles eastward of Kahamkamman islet and near the edge of the danger line marked on the chart. A 4¼-fathom (7$^{\text{m}}$8) coral patch lies 2¼ miles south-eastward of the eastern Samson patch.

May Williams shoal, with a least depth of 2 fathoms (3$^{\text{m}}$7) over it, and steep-to, lies about 1¼ miles south-south-eastward of Kahamkamman islet.

Latoan island, about 4½ miles southward of Kahamkamman islet, and 3¼ miles from the eastern side of Banguey island, lies on the south-western part of a reef which dries; the island is wooded.

Outer Latoan patch is the easternmost of three patches which lie off the north-eastern edge of the reef extending north-eastward from Latoan island; near the eastern edge of the patch is a rock, with a depth of less than 6 feet (1$^{\text{m}}$8) over it. On the north-eastern edge of the middle of the three patches about one mile west-north-westward of Outer Latoan patch, are some rocks, 5 feet (1$^{\text{m}}$5) high.

East Banguey patches are two small coral shoals, with depths of 2 and 2¾ fathoms (3$^{\text{m}}$7 and 5$^{\text{m}}$0) over them, lying 2¾ and 3½ miles, respectively, south-eastward of the southern extremity of Latoan island (*Lat. 7° 16′ N., Long. 117° 20′ E.*).

Bankawan island lies about three-quarters of a mile from the eastern side of Banguey island; on the reef extending 3 miles from its eastern side are several islands; abreast the middle of these reefs is a detached reef, the outer edge of which lies 3¾ miles from the island. From the southern point of the island numerous small reefs extend 2 miles, which, with the Bankawan reefs and the detached reef eastward of it, form the northern limit of Bankawan channel.

Boats only can pass between the various reefs comprising the Bankawan and Latoan islands group, but between them and the reef fronting Banguey island there is a deep channel through which it is possible for small vessels to pass, although near the western point of Bankawan the channel is narrowed to little more than one cable by a small reef in the fairway.

The area eastward of the reefs herein mentioned has not been thoroughly examined, so that shoals not charted may exist.

Charts 287, 2660b, 1263.

Chart 948.

BANGUEY SOUTH CHANNEL.—Banguey South channel, leading from the China into the Sulu sea, is somewhat intricate and requires careful navigation, being for the greater part of its length bordered by dangers, and with others near the fairway. The western entrance, about 1¾ miles wide, lies between the Molleangan islands and Outer shoal off-lying the coasts of Banguey and Borneo, respectively.

The northern limit of the channel is formed by the islands lying close-to the southern coast of Banguey, which appear to be part of that coast, Carrington reefs, and South-east Banguey dangers. The southern limit of the channel is formed by the North-west Borneo and North Borneo dangers, South Channel dangers, the reefs off the northern part of Mallawallé, Mallawallé Eastern dangers, and Fairway shoal.

Chart 3728.

Islands and dangers.—**Beacons.**—Molleangan island, 466 feet (142^{m}0) high, lies 1¼ miles south-westward of Kalutan point, the southern extremity of Banguey island; the south-eastern and north-eastern sides of the island are steep-to, but the remaining coasts are fringed by reefs and rocks above water, extending three-quarters of a mile offshore. Several reefs with rocks above and below water lie about half a mile northward of Molleangan island.

About one mile south-westward of Molleangan island is Little Molleangan island, from which a spit, with depths of less than 3 fathoms (5^{m}5) over it, extends about 3½ cables eastward and foul ground about three-quarters of a mile westward.

Lying within 3 miles of the north coast of Borneo are the N.W. Borneo and North Borneo dangers, consisting of coral shoals, generally of small extent, some of which partially dry, whilst others dry entirely, and two are marked by sand cays, which show up well in the sunlight. Only those dangers which border the various channels available for shipping will be described.

Outer shoal, on the eastern side of which there is a patch which dries, lies on the southern side of the western entrance to Banguey South channel, about 2½ miles south-south-westward of Little Molleangan island. This shoal, which is steep-to, is the largest of the N.W. Borneo dangers (*Lat. 7° 01′ N., Long. 117° 03′ E.*).

A tripod beacon, surmounted by a staff and black cone, stands on the north-western end of Outer shoal.

A sand cay, situated on the eastern side of a coral ledge nearly awash and steep-to, lies 3¼ miles east-south-eastward of Outer shoal beacon. About midway between the sand cay and the eastern edge of Outer shoal is a small coral patch, with a depth of 6 feet (1^{m}8) over it, and steep-to.

Another sand cay in the middle of a coral ledge, lies about 4¼ miles eastward of the beacon on Outer shoal. These cays are useful as marking the limits of the southern side of the channel, and being composed of white coral sand are well defined.

Pearson rock, with a depth of less than 6 feet (1^{m}8) over it, lies about 5 miles east-north-eastward of the beacon on Outer shoal; another rock, with a depth of less than 6 feet (1^{m}8) over it, the position of which is approximate, lies about half a mile south-eastward of Pearson rock. About 7¼ miles eastward of the beacon on Outer shoal is a 2-fathom (3^{m}7) patch, with two ledges, which dry, a short distance southward;

Charts 287, 967, 2660b, 1263.

Chart 3728.

this shoal and Pearson rock are the northernmost of the North Borneo dangers. The dangers farther south-eastward are described with Mallawallé channel, on page 127.

Ten-foot rock (*Lat. 7° 04′ N., Long. 117° 06′ E.*), with a depth of 1½ fathoms (2^{m}7) over it, and steep-to, lies in the fairway of Banguey South channel, about 3 miles south-eastward of the southern extremity of Molleangan island. As there may be other dangers in this vicinity caution should be exercised. There are heavy tide-rips about half a mile southward of Ten-foot rock.

Petrel rock, a narrow ridge of coral, with a depth of 2¼ fathoms (4^{m}1) over it, and steep-to, lies about 6 cables north-north-eastward of Ten-foot rock. A 1¾-fathom (3^{m}2) patch lies about 9 cables eastward of Petrel rock, and is marked by a beacon, consisting of a staff surmounted by a black cone.

Charts 3728, 948.

Patanunam island, 428 feet (130^{m}4) high, lies three-quarters of a mile eastward of Kalutan point; its summit is well defined. The island is fringed by a coral reef extending 2 cables from its southern extremity, whilst close off the north-eastern end there is a detached narrow reef extending nearly one mile in that direction.

Chart 1220.

Pagassan island, which is hilly, lies about 2 miles north-eastward of Patanunam and close off the southern side of Banguey island. It is fringed by a reef which extends 3 cables from the southern side, with a rock nearly awash one cable beyond. About 7½ cables westward of this rock is a reef, with a depth of 4 fathoms (7^{m}3) over it, close westward of it, and a shoal, with a depth of 5 fathoms (9^{m}1) over it, close south-westward. Close south-westward of the western extremity of Pagassan island is another island. The area between these two islands and the southern coast of Banguey island is Mitford harbour, which is described on page 120. A reef extends from one to 5½ cables from the eastern side of Pagassan island, forming the western side of East entrance to the harbour.

Charts 1220, 948.

Lampassan island, densely wooded, lies three-quarters of a mile eastward of the northern end of Pagassan island. From its south-eastern side coral spits extend about three-quarters of a mile, and from its western side a reef extends from one to 2 cables, forming the eastern side of East entrance to Mitford harbour.

Modum island, densely wooded, lies northward of East entrance, the passage between Pagassan and Lampassan islands; a reef on which are patches of sand and coral, which dry, extends about 3½ cables from the western side of Modum island.

Chart 948.

About half a mile eastward of Lampassan island a point extends from Banguey island towards the channel, forming the western side of an inlet encumbered with reef, the other side being a peninsula forming the south-eastern end of Banguey island. A short distance off the point, on the reef extending about half a mile from it, lie two islets, and from these a number of rocks, almost connected, extend in a south-south-westerly direction nearly 1½ miles. The south-eastern extremity of Banguey island is fringed by reef, beyond which and off the mouth of the inlet just mentioned lie two patches of reef, and a rock, with a

Charts 287, 967, 2660b, 1263.

Chart 948.

depth of less than 6 feet (1^m8) over it, the latter being about one mile from the coastal reef.

South Channel dangers comprise six coral reefs lying in the fairway eastward of Petrel rock (*Lat. 7° 04′ N., Long. 117° 06′ E.*), with irregular depths between; the two westernmost dry, and the one next eastward is a strip of coral with a rock nearly awash at its eastern extremity. A 4-fathom (7^m3) patch lies about one mile north-north-eastward of the westernmost reef, and two 2½-fathom (4^m6) patches lie, respectively, 6 cables south-south-eastward and 1½ miles north-eastward of the rock nearly awash. Between the different dangers are passages which it is possible for vessels to pass through, but, as this would serve no useful purpose, it is advisable to consider these shoals as a dangerous group.

Carrington reefs, situated about 2¼ miles south-eastward of Lampassan island, are composed of coral, and for the greater part dry. About 4 cables from the middle of the northern side of the reefs is a 2½-fathom (4^m6) patch. Between this shoal and the dangers extending from the southern side of Banguey island is a channel three-quarters of a mile wide, but which, as a matter of ordinary navigation, no vessel should use. It is, however, available for small steam vessels with local knowledge, which may subsequently round the Carrington reefs and return into Banguey South channel; or they may proceed into the Sulu sea, either by the narrow and intricate passage between the coastal reefs and those surrounding Bankawan and Latoan islands, or by Bankawan channel.

Bankawan channel, separating Bankawan reefs from South-east Banguey dangers, is about three-quarters of a mile wide at its narrowest part, and deep in the fairway. Vessels should keep a good look-out for the reefs on either side; with proper precautions there will be no difficulty in safely navigating the channel.

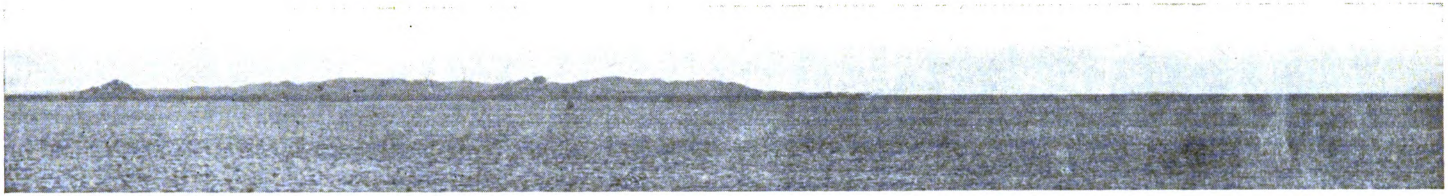
The main channel, however, lies between the Carrington reefs and those off the northern part of Mallawallé island, and this is the only channel which should be used by strangers; vessels should take care not to get into a depth of less than 13 fathoms (23^m8) when passing the southern side of Carrington reefs.

Mallawallé island, 562 feet (171^m3) high near the north-western end, lies about 8 miles south-eastward of Pagassan island. Close off the western side of the island is West islet; North-west islet lies close off the north-western end, and North islet, which is low, is nearly connected to the northern side of the island. *See* view facing this page. The island is fringed by a reef which extends nearly one mile offshore from the eastern, northern, and western sides and about half a mile from the southern side. Mallawallé island is a British possession.

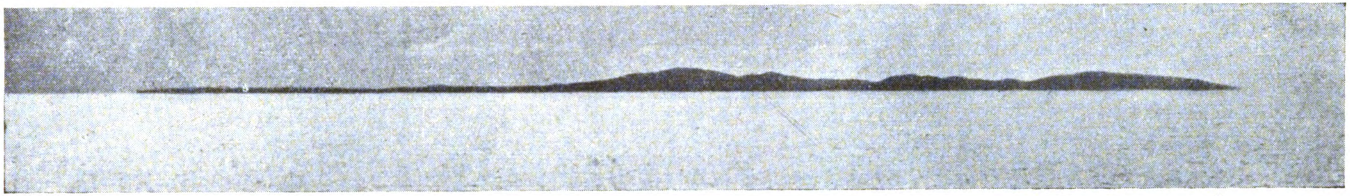
A sand cay lies on a reef about 6 cables north-eastward of North islet (*Lat. 7° 05′ N., Long. 117° 17′ E.*) with patches eastward and westward of it, the positions of which may be seen on the chart. Another sand cay marks the western end of a reef about one mile east-north-eastward of the eastern point of Mallawallé island; about 1¼ miles north-north-westward of this sand cay there is a narrow coral reef, which is steep-to.

South-east Banguey dangers comprise an extensive group of reefs and shoals, situated about 1¾ miles eastward of Carrington reefs. The western end of the group is defined by two small isolated reefs, which dry and are steep-to; a good look-out is essential when nearing them,

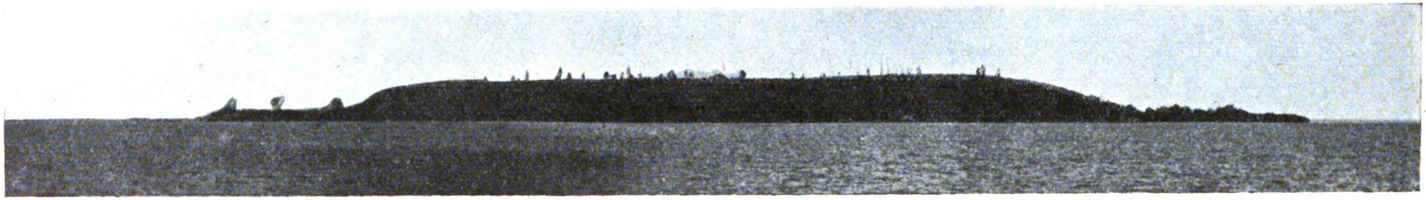
Charts 287, 967, 2660b, 1263.



Balambangan island, from about 2 miles northward of the north-western point of Borneo.
(*Original dated* 1918.)



Mallawallé island, from about 7 miles westward.
(*Original dated* 1918.)



Tigabu island, bearing 315°, distant 2 miles.
(*Original dated* 1918.)

Chart 948.

and the same precaution should be observed when passing through the channel, as the reefs forming the southern edge of these dangers are all steep-to. The eastern part of South-east Banguey dangers is encumbered by a number of coral patches, with depths of from 1¾ to 5 fathoms ($3^{m}2$ to $9^{m}1$) over them.

Mallawallé Eastern dangers comprise a large number of detached reefs and shoals which extend 10 or 11 miles eastward and south-eastward from Mallawallé island. Only those dangers lying on the southern edge of Banguey South channel will be described here, for no vessel should attempt to navigate amongst these reefs. For dangers farther southward, *see* page 130.

About 2½ miles north-eastward of the sand cay off the eastern end of Mallawallé island is a narrow coral reef, which dries and is steep-to. About 3½ cables southward of this reef is a reef, with a depth of less than 6 feet ($1^{m}8$) over it, and steep-to. A group of reefs, which is steep-to on its northern side, lies one mile eastward of the narrow coral reef just described ; about 1½ miles farther eastward is a reef, with a depth of 1¼ fathoms ($2^{m}3$) over its northern end ; this danger, being always covered, is not so readily seen as the others.

Straggler island, 20 feet ($6^{m}1$) high and wooded, lies 8¼ miles east-north-eastward of the eastern extremity of Mallawallé island. The reef on which the island lies extends about one mile eastward and about half a mile south-westward.

About 1¼ miles south-eastward of Straggler island is a reef, with a depth of less than 6 feet ($1^{m}8$) over it, another reef with a similar depth over it, lies about 2 miles south-eastward of the same island ; half a mile eastward of the latter reef is a 3¼-fathom ($5^{m}9$) coral patch. Other dangers of the group extend 7 miles farther southward.

Fairway shoal, on the southern side of which there is a rock awash, lies at the eastern entrance of Banguey South channel, 2¾ miles north-eastward of Straggler island. The channel between the shoal and the eastern end of South-east Banguey dangers is 3 miles wide and deep.

Chart 287.

About 1½ miles eastward of Fairway shoal there is a 3¼-fathom ($5^{m}9$) patch, which is steep-to, and 3¼ miles north-eastward there is a 7-fathom ($12^{m}8$) patch.

Dangers in northern and eastern approaches to Banguey South channel.—In the eastern approach to Banguey South channel, and 9½ miles north-eastward of Straggler island (*Lat. 7° 05′ N., Long. 117° 29′ E.*) is Mæander patch, with a depth of 1¾ fathoms ($3^{m}2$) over it, and steep-to. About one mile westward of it is a 3-fathom ($5^{m}5$) patch and 1½ miles eastward a 6-fathom ($11^{m}0$) patch. Two 4-fathom ($7^{m}3$) patches lie 2 and 4 miles, respectively, southward of Mæander patch. A shoal, with a depth of 1¾ fathoms ($3^{m}2$) over it, lies about 5 miles north-eastward of Mæander patch, and within 8 miles south-eastward of this shoal are several other dangers, the positions of which may best be seen on the chart. A 3¼-fathom ($5^{m}9$) patch lies at the south-eastern end of this area, and between it and a position about 6½ miles north-eastward, less water was reported in 1950. For dangers farther southward, *see* page 128.

A bank, with a depth of 9 fathoms ($16^{m}5$) over it, and steep-to, lies about 29 miles north-westward of the summit of Kagayan Sulu (page 73).

Charts 967, 2660b, 1263.

Charts 287, 967.

In the northern approach to Banguey South channel, extending to the parallel of 7° 23′ N., there are numerous coral patches dangerous to navigation, the positions of which may best be seen on the chart. The northernmost of these dangers have been described on page 114. Vessels should avoid this area.

Charts 3728, 948.

Directions for Banguey South channel.—Attention to these directions must be supplemented by a vigilant and careful lookout from aloft. The best time for proceeding through from westward is with the sun astern, when there is seldom much difficulty in making out the various dangers. Balabac Main channel, however, is considered a safer route.

A vessel having rounded Pulau Kalampunian, close off the northern extremity of Borneo, should steer for Molleangan island, bearing about 092°, and when about 7 miles from its summit steer to pass about one mile southward of Little Molleangan, observing that the whole of Patanunam island should not be opened south-eastward of Molleangan island until the summit of Little Molleangan bears 024°, which will lead northward of Outer shoal. Having passed Little Molleangan she should alter course north-eastward, keeping within one mile of Molleangan and Patanunam islands.

Chart 948.

Having passed those islands, the vessel should keep the peak of Patanunam astern, bearing 265°, which leads through the fairway between the South Channel dangers and the rock off the southern end of Pagassan island, until the sand cay off the northern side of Mallawallé island is abeam, distant about 1½ miles, when she should steer 109°, which will lead clear of the dangers off the northern side of Mallawallé island. When the sand cay off the eastern extremity of that island bears 182°, distant a little over 2 miles, she should steer 069°, which will lead one mile northward of Fairway shoal and into the Sulu sea.

A vessel from westward intending to enter Mallawallé channel should proceed as directed above until in a position about one mile southward of Patanunam island, when she should alter course south-eastward and pass about 3 cables north-eastward of the beacon marking the 1¾-fathom ($3^{m}2$) patch, situated about 2½ miles south-south-eastward of the north-eastern extremity of Patanunam island (*Lat. 7° 06′ N., Long. 117° 05′ E.*).

Chart 1220.

Mitford harbour.—Mitford harbour, situated on the southern side of Banguey island, and within Pagassan and other islands, described on page 117, has only been partially surveyed. In it there are numerous coral reefs, but there appear to be clear spaces of considerable size; one of these off the site of the old settlement, abreast Middle entrance, has depths of from 5 to 11 fathoms ($9^{m}1$ to $20^{m}1$).

There are three entrances: West entrance and channel within has a depth of about 5 fathoms ($9^{m}1$); Middle, the principal entrance, between Pagassan island and the island westward of it, is about one cable wide, and has depths of from 7 to 10 fathoms ($12^{m}8$ to $18^{m}3$); East entrance, between the reefs extending from Pagassan and Lampassan islands, is 2¼ cables wide, narrowing to 1¼ cables between the north-eastern point of Pagassan island and the southern side of Modum

Chart 1220.

island, the depths varying from 6 to 10 fathoms (11^{m}0 to 18^{m}3). There are no dangers in East channel, which has a north-north-westerly direction for about one mile, and then turns westward, northward, and eastward around the reef extending off the western end of Modum island, to the anchorage between that island and the southern side of Banguey. A depth of 5 fathoms (9^{m}1) can be carried up to the anchorage.

A small settlement is situated on the coast of Banguey island, north-westward of Modum island.

Anchorage.—Directions.—Anchorage may be obtained, in depths of from 4 to 5 fathoms (7^{m}3 to 9^{m}1), sand and ooze, in mid-channel between Banguey and Modum islands, abreast the middle of Modum, where the channel is a quarter of a mile wide between the reefs which extend from either side. The approach to this anchorage is through East entrance.

West entrance is not recommended.

A vessel using Middle entrance should avoid the two shoal patches off the southern end of Pagassan island, thence she should steer for the hill, 663 feet (202^{m}1) high, on Banguey island, bearing 315°; which leads through the middle of the entrance; when inside the islands, she should steer for the head of the pier, situated on Banguey island, about three-quarters of a mile north-westward of the western extremity of Pagassan island, avoiding Hong Aun reef (*Lat. 7° 08′ N., Long. 117° 06′ E.*), 1½ cables south-south-eastward of the head of the pier. *See* caution under the title of chart 1220.

A vessel using East entrance should approach with the south-western extremity of Modum island bearing 329°, and when in the middle of the entrance should steer about 340° for about one mile, thence she should follow the curve of the channel to the anchorage, keeping midway between the reefs on either side. There are no dangers in the channel.

Chart 3728.

MARUDU BAY.—Marudu bay, into the head of which Marudu river flows, is entered between Tanjong Sampanmangio, the northern extremity of Borneo, and Cape Mafsie, 18 miles east-south-eastward.

Low hills rise from the western shore to an elevation of over 500 feet (152^{m}4); Melau besar, 680 feet (207^{m}3) high, about 1¼ miles westward of Pirate point, situated about 17 miles south-south-eastward of Tanjong Sampanmangio, and Matungun, 1,360 feet (414^{m}5) high, 5 miles south-south-westward of Melau besar, are conspicuous, the summit of Melau besar being bare and flat, while Matungun is thickly wooded.

From the south-eastern shore the hills rise to an elevation of over 2,000 feet (609^{m}6), and are all thickly wooded.

The rivers flowing into the bay shift their channels after each rainy season, and are only available for boats after the beacons have been replaced in position.

Anchorage.—Anchorage may be obtained, in depths of from 5 to 10 fathoms (9^{m}1 to 18^{m}3), mud, almost anywhere near the shores of the bay.

For anchorages at the head of the bay, *see* page 127.

Pulau Kalampunian.—Light.—Pulau Kalampunian, one mile northward of Tanjong Sampanmangio, is of sandstone formation,

Charts 948, 287, 967, 2660b, 1263.

Chart 3728.

similar to the nearest bluff of that point, and rises abruptly from a flat, composed of detached reefs, to an elevation of 40 feet ($12^{m}2$). A reef, which dries about 6 feet ($1^{m}8$), extends about half a mile south-eastward from the island.

There is a safe channel nearly half a mile wide between the island and Tanjong Sampanmangio, with a least charted depth of 6 fathoms ($11^{m}0$) in the fairway. The reefs on either side are visible and can be easily avoided by a careful look-out from aloft.

A light is exhibited, at an elevation of 85 feet ($25^{m}9$), from an iron tower on a stone column, with red and white bands, 45 feet ($13^{m}7$) in height, on Pulau Kalampunian.

Outer part of Marudu bay.—Dangers.—Beacons.—Tanjong Sampanmangio may be identified by the tall casuarina trees which stand on its grassy bluff, and by Pulau Kalampunian off it. Between the point and Tanjong Tajau, 6¾ miles south-eastward, the coast is bordered by rocks, and the coastal bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends half a mile offshore in places; thence to Tanjong Kapor, which is 60 feet ($18^{m}3$) high, about 4¾ miles south-south-eastward, the coast is foul for a distance of half a mile offshore. The highest point of the extremity of Tanjong Kapor is Targett rock, which is 30 feet ($9^{m}1$) high and is marked by a concrete block. Tanjong Agong Agong and Agong Agong river are about 1½ miles and 1¾ miles, respectively, south-south-eastward of Tanjong Tajau. Two 4½-fathom ($8^{m}2$) patches and a 4¾-fathom ($8^{m}7$) patch lie, respectively, about three-quarters of a mile east-south-eastward and 4 cables eastward of Tanjong Agong Agong.

Chart 946.

Between Tanjong Kapor and Tanjong Bornugus, the northern entrance point of Kudat harbour, one mile south-south-westward, a reef of sand and coral, which dries in patches, extends from about 3½ to 6 cables offshore. A shoal, with depths of 2 and 3 fathoms ($3^{m}7$ and $5^{m}5$) over it, lies outside this reef, about 9 cables eastward of Tanjong Bornugus. There is a short pier about 3½ cables north-north-eastward of Tanjong Bornugus.

Chart 3728.

Cape Mafsie (*Lat. 6° 56′ N., Long. 117° 02′ E.*), the eastern entrance point of Marudu bay, is 56 feet ($17^{m}1$) high, with conspicuous white cliffs close north-eastward of it, and a sharp rock, 35 feet ($10^{m}7$) high, with another rock, 30 feet ($9^{m}1$) high, lying close north-eastward of it. The cape is fringed by a reef which extends about 3½ cables westward and 2 miles northward; the eastern edge of the reef forms the western side of the inlet leading to Melobong river. A detached reef, the southern part of which dries, lies a quarter of a mile off the north-western extremity, and foul ground extends three-quarters of a mile northward of the fringing reef. Between the reef and the coast are deep narrow channels.

A shoal, with a least depth of 2 fathoms ($3^{m}7$) over it, lies 3½ miles north-westward of Cape Mafsie. A rocky shoal, the centre of which dries, lies about a quarter of a mile from the western edge of the fringing reef, and about 1¾ miles north-westward of Cape Mafsie, and a coral patch, with a depth of 2¾ fathoms ($5^{m}0$) over it, lies about 2 miles west-north-westward of the cape.

About 2½ miles southward of Cape Mafsie is Tanjong Perawan,

Chart 3728.

56 feet ($17^{\mathrm{m}}1$) high, and easily identified by its red cliffs. Casuarina trees extend along this part of the coast. Between Tanjong Perawan and the entrance to Benkoka river, about 3 miles southward, the coast forms a bay, off the shore of which the sand dries for a distance of a quarter to three-quarters of a mile, and a flat, with depths of less than 3 fathoms ($5^{\mathrm{m}}5$) over it, extends 2¼ miles offshore.

The entrance to Benkoka river, which is the largest river flowing into Marudu bay, is 4 cables wide, but rapidly decreases, to a uniform width inside, of one cable ; a sandspit extends about 1¾ miles westward from the northern entrance point, and lying on the southern edge of it and about one mile from the point is Benkoka islet, about 25 feet ($7^{\mathrm{m}}6$) high to the tops of the trees. About 1½ miles eastward of this islet the river turns sharply southward, and a branch runs south-eastward. Talaga village stands on the right bank of the latter branch, about 2 miles eastward of Benkoka islet. There are several other villages in the neighbourhood of the river.

The channel leading to the entrance of Benkoka river is marked by beacons, the positions of which are constantly changed as the channel alters. The depth on the bar is about 3 feet ($0^{\mathrm{m}}9$) in the channel, within which the depths increase. Launches of about 8 feet ($2^{\mathrm{m}}4$) draught can ascend the river at high water to the village of Pitas, a distance of 12 miles.

Chart 946.

Kudat harbour.—Dangers.—Light.—Beacons.—Kudat harbour is entered between Tanjong Bornugus and Tanjong Tigasamil, 1½ miles south-south-eastward. It affords anchorage, in depths of from 4 to 7 fathoms ($7^{\mathrm{m}}3$ to $12^{\mathrm{m}}8$), sheltered from the swell during the North-east monsoon by the reef which extends from Tanjong Bornugus. About one mile within the line joining the entrance points the depths shoal gradually from 3 fathoms ($5^{\mathrm{m}}5$) to the head of the harbour.

On the northern side of the harbour westward of the settlement there is a bay with depths of less than 3 fathoms ($5^{\mathrm{m}}5$), entered between the point situated half a mile westward of Tanjong Bornugus, and Egeria bluff, about 1¼ miles farther westward ; Bum Bun river, which has a depth of 1½ feet ($0^{\mathrm{m}}5$) on the bar, and from 2 to 4 fathoms ($3^{\mathrm{m}}7$ to $7^{\mathrm{m}}3$) within for a distance of 1½ miles, flows into the north-western corner of the bay. Telegraph wires cross the river mouth overhead, and are very low. About one mile westward of Egeria bluff (*Lat. 6° 53′ N., Long. 116° 49′ E.*) the land attains an elevation of 411 feet ($125^{\mathrm{m}}3$).

At the head of the harbour there are three bays encumbered with shoals. Pangka'an bay, the southernmost, is entered about 3 miles westward of Tanjong Tigasamil ; Tegarangan river discharges into the head of the bay, and has a depth of 1½ feet ($0^{\mathrm{m}}5$) in its entrance, and from 2 to 5 fathoms ($3^{\mathrm{m}}7$ to $9^{\mathrm{m}}1$) within for a distance of 1¼ miles.

Pamatadau river discharges into the head of the middle of the three bays.

Lengkabang bay, the northernmost of the three bays, has a depth of 3 feet ($0^{\mathrm{m}}9$) in its entrance, and dries from one to 3 feet ($0^{\mathrm{m}}3$ to $0^{\mathrm{m}}9$) about 5½ cables from its head. Langsana islet, 80 feet ($24^{\mathrm{m}}4$) high, lies just outside the entrance to this bay, and a rock, 2 feet ($0^{\mathrm{m}}6$) high, lies about 1½ cables north-eastward of the islet. Dampirit river discharges into the head of the bay.

Charts 948, 287, 967, 2660b, 1263.

Chart 946.

Conspicuous objects when approaching Kudat harbour are the light-structure on Sandilands rock, the beacon marking Gueritz rock, the jetty, town flagstaffs, radio mast and White rock.

Sandilands rock, with a depth of 1¼ fathoms ($2^{m}3$) over it, lies in the middle of the entrance to the harbour, and 9 cables south-eastward of Tanjong Bornugus.

A light is exhibited, at an elevation of 20 feet ($6^{m}1$), from a white pile structure with red bands, on Sandilands rock.

Witti rocks are two rocks, with a depth of less than 6 feet ($1^{m}8$) over them, lying about 1½ and 2¾ cables, respectively, northward of the light-structure on Sandilands rock. Close northward of each rock there is a 3-fathom ($5^{m}5$) patch.

Tigasamil spit, which dries, extends about 4 cables north-eastward of Tanjong Tigasamil, with depths of from 3 feet ($0^{m}9$) increasing to 2½ fathoms ($4^{m}6$) at 1½ cables beyond. Near the north-eastern extremity of the spit is a beacon, which cannot be depended on. An islet, 20 feet ($6^{m}1$) high, lies close off Tanjong Tigasamil. A reef, which dries, and on which is Tern rock, 4 feet ($1^{m}2$) high, extends a quarter of a mile northward of the northern part of Tanjong Tigasamil.

Gueritz rock, with a depth of about 3 feet ($0^{m}9$) over it, forms the southern extremity of the reef which extends offshore between Tanjong Kapor and Tanjong Bornugus, and is marked by a beacon with a white topmark.

Datum rock, only covered at the highest spring tides, dries 6½ feet ($2^{m}0$), and lies on the edge of the bank fringing the northern shore, 4 cables westward of Tanjong Bornugus.

A rock, with a depth of less than 6 feet ($1^{m}8$) over it, lies in the middle of the harbour, about three-quarters of a mile west-south-westward of Datum rock.

White rock, 27 feet ($8^{m}2$) high, lies on the edge of the reef extending from the southern shore, about 2¼ miles westward of Tanjong Tigasamil; between them the southern shore is bordered by a reef extending a quarter of a mile off in places. The hills on the southern side of the harbour attain an elevation of 460 feet ($140^{m}2$).

Anchorage. — Directions. — The best anchorage is in a depth of about 6½ fathoms ($11^{m}9$), mud, southward of the settlement, with the flagstaff near Tanjong Bornugus bearing 354°, distant about 6½ cables, and Sandilands rock light-structure, 085°; or, nearer the settlement if the draught permit.

Charts 946, 3728.

A vessel, after passing Pulau Kalampunian, should not close the coast within 2 miles; when abeam of Tanjong Tajau, Melau besar will be seen southward of Kudat harbour, and if kept open eastward of Tanjong Tigasamil, bearing 199°, will lead eastward of the reef extending from Tanjong Kapor, and of Sandilands rock; and when Johnstone bluff, on the northern shore near the head of Kudat harbour, bears 275° she may steer for it, passing between Sandilands rock and Tigasamil spit. A course may then be shaped for the anchorage.

Chart 946.

Tidal streams.—The tidal streams are weak, the maximum observed during a stay of three months being half a knot.

Kudat.—Kudat (*Lat. 6° 53′ N., Long. 116° 51′ E.*) is a settlement situated on the northern point of the entrance to the harbour; it owes its

Chart 946.

importance to its being the distributing centre of the various tobacco and rubber estates in the vicinity.

The South-west monsoon is the most unhealthy period at Kudat; fever is then prevalent, whilst during the opposite season, with the wind coming across the sea, it is almost absent.

There are Government offices, including post and telegraph offices, and several churches; there is also a native hospital and a European cemetery.

A District officer resides at Kudat.

Beef, vegetables and fruit are plentiful. Bread is scarce. Water is laid on to the jetty.

The chief exports are tobacco, rubber, and copra.

Jetty.—Pier.—There is a jetty, 132 feet (40^m2) in length, situated about 1½ cables westward of Tanjong Bornugus; there is a depth of 14 feet (4^m3) alongside it during the South-west monsoon, and about 2 feet (0^m6) more during the North-east monsoon. There is also a pier, 200 feet (61^m0) long, with a **T**-head.

Buoys.—There is a mooring buoy about half a cable southward of the eastern end of the jetty, and a hauling off buoy.

Communication.—There is regular communication by steamer with Singapore and Sandakan.

Kudat is connected to the general telegraph system.

Radio station.—There is a radio station at Kudat. *See* page **14.** The radio mast is situated about half a mile north-north-eastward of Tanjong Bornugus (*Lat. 6° 53′ N., Long. 116° 51′ E.*).

Chart 3728.

Inner part of Marudu bay.—Dangers.—Beacons.—Pulau Melau, 65 feet (19^m8) high, lies on the western side of Marudu bay, about 1¾ miles southward of Tanjong Tigasamil, and is connected with the western shore of the bay at low water. A reef, which dries, extends half a mile east-south-eastward and southward, and from the eastern part a bank, with depths of less than 3 fathoms (5^m5) over it, extends another 1½ cables; on the southern side of the reef there are depths of 7 fathoms (12^m8) close-to.

A 1¾-fathom (3^m2) patch lies about 3½ cables north-eastward of Pulau Melau, and is marked on its north-eastern side by a beacon.

In the bay between Tanjong Tigasamil and Pulau Melau there are depths of from 8 to 10 fathoms (16^m5 to 18^m3), and it is clear of dangers outside a distance of 6 cables from the shore; within that distance the shores of the bay are fringed by reefs and fronted by detached rocks.

Pirate point, 3 miles southward of Pulau Melau, is a low sandy point fringed with mangroves; a sandy spit extends half a mile eastward from this point and to the mouth of a small river situated half a mile northward. South-westward of the point the coast is fringed with mangroves, and small streams flow out at intervals; reefs, sand and mud flats extend about 4 cables offshore in places.

On the eastern side of Marudu bay, between the mouth of the Benkoka river and the point about 7 miles south-westward of Benkoka islet, the coast is sandy and bordered with high casuarina trees; it is fringed by a bank which extends, with depths of less than 3 fathoms (5^m5) over it, from three-quarters of a mile to 1½ miles offshore. Tenga river, a branch of Benkoka river, discharges into the bay between two

Charts 287, 967, 2660b, 1263.

Chart 3728.

sandspits, which extend about three-quarters of a mile offshore, at about 1½ miles south-south-westward of Benkoka islet (*Lat. 6° 50′ N., Long. 117° 02′ E.*). The depth on the bar between these two spits is about one foot ($0^{m}3$).

Taka river discharges about 3¼ miles south-westward of the mouth of Tenga river. The western side of the entrance channel is formed by a sandspit which extends northward for more than one mile. There is a depth of less than 2 feet ($0^{m}6$) on the bar of Taka river, situated off the extremity of the sandspit ; the bar generally breaks.

Zebra reefs are several coral patches, one of which dries, with deep water between them, and also between them and the shore eastward of them ; they lie about 2¾ miles south-westward of the northern extremity of the sandspit which extends from the mouth of Taka river, and from 6 to 9 cables offshore.

Barraut reef, a rocky shoal with a least depth of 4 feet ($1^{m}2$) over it, lies on a coral patch near the middle of Marudu bay, 4¼ miles south-eastward of Pirate point. A wooden beacon with a white top stands on the southern end of the reef.

Brandon reefs, consisting of several large coral patches which nearly dry, lie about 4½ miles south-south-westward of Pirate point ; the outer patch, with a depth of 1¾ fathoms ($3^{m}2$) over it, lies 5½ miles from Pirate point and 2 miles offshore. Woody island, about 18 feet ($5^{m}5$) high, lies about 8½ miles south-south-westward of Pirate point, and about one mile from the southern entrance point of Matungun river, to which it is connected by a sandbank, which dries 2 feet ($0^{m}6$) ; it is a small mound surrounded by low rocks studded with mangroves.

On the eastern side of Marudu bay there is a bight lying between the point abreast of Zebra reefs and a point 2¾ miles southward ; its shores are intersected by streams fringed with mangroves, and the hills inland slope gradually to the shore ; a bank of coral and sand extends half a mile offshore in places.

Chart 3728, plan of Cutch factory anchorage.

Good anchorage for small vessels may be obtained off Mempakit village, situated on the eastern shore of Marudu bay, about 10 miles south-south-westward of Benkoka islet (*Lat. 6° 50′ N., Long. 117° 02′ E.*), in a depth of 7 fathoms ($12^{m}8$), mud, about 3½ cables offshore, or farther out as convenient.

Powell rock, with a depth of less than 6 feet ($1^{m}8$) over it, lies about 4½ cables offshore, and three-quarters of a mile northward of Mempakit village. South-eastward of the rock a reef, which dries, extends 2¾ cables offshore.

Chart 3728.

Ridge point lies 3½ miles south-westward of Mempakit village, the coast between being fringed by a reef of sand and coral, which extends about one mile north-north-eastward from Ridge point.

Chart 3728, plan of Marudu river and Tg. Batu anchorages.

Head of Marudu bay.—Tanjong Batu, 4 miles south-westward of Ridge point, is a low point, on the western and southern sides of which sandspits, which dry, extend off about one cable. Mari Sim sim river flows out on the southern side of the point. Between Tanjong Batu (*Lat. 6° 37′ N., Long. 116° 51′ E.*) and the point three-quarters of a mile southward there is a small and shallow bay, the mud at the head of which dries for a distance of 1½ cables offshore.

Charts 287, 967, 2660b, 1263.

Chart 3728.

On the western side of the head of Marudu bay, from abreast Woody island the coast is fringed with mangroves and intersected by small streams as far as the entrance to Marudu river, about 4 miles southward, and is fronted by extensive sand and mud flats, the latter of which dry from one to 2 feet (0^m3 to 0^m6).

Chart 3728, plan of Marudu river and Tg. Batu anchorages.

The channel leading to the entrance of Marudu river has a least depth of 1½ feet (0^m5) and follows a general west-south-westerly direction for about 3 miles between extensive mudbanks which extend 2 miles offshore, and dry from one to 5 feet (1^m5).

Beacons mark the channel leading to the entrance of the river, but their positions are constantly changed as the channel alters.

Small launches of about 6 feet (1^m8) draught can ascend this river for about 1½ miles at high water, but the channel must be previously marked by beacons.

Marudu river was stated, in 1908, to be gradually shoaling. Between the entrance of the river and that of Taritipan river, 5 miles eastward, the coast is covered with dense mangroves; mudbanks, which dry from one to 2 feet (0^m3 to 0^m6), fringe the shore. Behind the mangroves at the head of the bay are several rubber and tobacco estates.

Anchorages.—Vessels with a draught of 20 feet (6^m1) may obtain anchorage, in a depth of 5¼ fathoms (9^m6), with Tanjong Batu bearing 060°, distant 8½ cables, and those of less draught with Tanjong Batu bearing 034°, distant three-quarters of a mile, in a depth of about 4 fathoms (7^m3), mud.

Vessels with a draught of 15 feet (4^m6) may obtain anchorage, in a depth of about 3½ fathoms (6^m4), mud, off the entrance to Marudu river, with the southern extremity of Tanjong Batu bearing 104°, distant about 2½ miles. Large vessels should anchor 3 cables northeastward of this position, in depths of from 5½ to 6 fathoms (10^m1 to 11^m0).

Chart 3728.

NORTH-EASTERN SIDE OF BORNEO.—Coast.—Beacon.—Caution.—About 1¼ miles north-eastward of Cape Mafsie is the southwestern entrance point of an inlet leading to Melobong river. The north-eastern entrance point of the inlet is fringed by a reef which contracts the width of the channel to about 6 cables; the south-western extremity of this reef is marked by a beacon. The head of the inlet is much encumbered by mudbanks, which leave a narrow channel towards the north-eastern shore.

Pulau Perak (*Lat. 6° 59′ N., Long. 117° 03′ E.*), thickly wooded, and the tops of the trees about 90 feet (27^m4) high, lies on the edge of the coastal reef about a quarter of a mile north-westward of the northeastern entrance point of the inlet described above. Owing to the risk of uncharted dangers vessels should not go inside the pecked line indicated on the chart.

Chart 948.

Mallawallé channel.—Dangers.—Beacon.—Mallawallé channel lies between the north-east coast of Borneo and Mallawallé island, which has been described on page 118.

Inaruntang point is the northern extremity of a peninsula which extends northward for about 23 miles between Marudu and Paitan

Charts 287, 967, 2660b, 1263.

Chart 948.

bays. On the south-western side of Mallawallé channel between Inaruntang point and a point about 3 miles south-eastward, the shore is fringed by a bank on which there are numerous reefs and rocks, sunken and awash extending 2¼ miles offshore.

Charts 1650, 948.

Silk island, 3¼ miles south-eastward of Inaruntang point and a quarter of a mile offshore, is fringed by a reef which extends half a mile from its eastern side; the north-eastern side of the island consists of a red cliff, 36 feet ($11^{m}0$) high.

About 1¼ miles north-eastward of Silk island is a cay lying on a reef which extends about one mile northward and southward from it. Between this reef and the North Borneo dangers, which have been described on page 116, there are several sunken dangers, the positions of which can best be seen on the chart.

Egeria rocks, with a depth of 3 feet ($0^{m}9$) over them, and steep-to, lie in the middle of the north-western end of Mallawallé channel, about 2½ miles westward of West islet. Shoals, with depths of from 5¾ to 6½ fathoms ($10^{m}5$ to $11^{m}9$) over them, lie within one mile south-westward and southward of Egeria rocks.

Lin gi san is a rocky reef, 30 feet ($9^{m}1$) high, lying on the south-western side of the channel, about 3¼ miles eastward of Silk island. Tree rock, 22 feet ($6^{m}7$) high, lies 1½ miles southward of Lin gi san. Passage reef, awash, and easily distinguished, lies about 1¼ miles north-eastward of Lin gi san, and may be passed on either side, but the channel north-eastward of it is recommended.

A tripod beacon, surmounted by a black cone, stands on the north-eastern side of Passage reef (*Lat. 6° 59′ N., Long. 117° 17′ E.*).

Heavy tide-rips occur about one mile east-north-eastward of Passage reef. A reef, awash, on which is a small sand cay, lies about 2¾ miles eastward of Passage reef beacon. Fly rock, with a depth of less than 6 feet ($1^{m}8$) over it, lies 1¾ miles south-eastward of the same beacon. About half a mile southward of Fly rock is a coral reef, parts of which dry.

Chart 948.

The south-western extremity of West islet in line with Banguey peak, bearing 325°, leads between Passage reef and the cay eastward of it, and north-eastward of Fly rock.

Chart 1650.

Kukuban sand cay (page 129) in line with the north-eastern extremity of Tigabu island, bearing 117°, leads between Fly rock and the cay mentioned above.

About 3¾ miles east-south-eastward of the southern point of Mallawallé island is a group of small reefs, the north-eastern of which dries one foot ($0^{m}3$). Between this group and the south-eastern side of Mallawallé island are two rocks, with a depth of less than 6 feet ($1^{m}8$) over them. Farther eastward are the southernmost reefs of the Mallawallé Eastern dangers, the positions of which can best be seen on the chart.

The northernmost of the Mallawallé Eastern dangers have been described on page 119.

Charts 1650, 287.

Outlying dangers.—Pudsey Dawson dangers are a series of coral patches, the westernmost of which, with a depth of 2½ fathoms

Charts 287, 967, 2660b, 1263.

Charts 1650, 287.

(4^{m}6) over it, lies 18½ miles eastward of the eastern extremity of Mallawallé island (*Lat. 7° 03′ N., Long. 117° 21′ E.*); from this patch, for about 17½ miles eastward, there are several banks, principally coral and sand, with depths of from 2½ to 10 fathoms (4^{m}6 to 18^{m}3) over them, and deep water between them. About 3¾ miles west-north-westward of the westernmost danger is a shoal, with a depth of less than 6 feet (1^{m}8) over it.

For the Minna reefs, situated 4 miles south-westward of the westernmost danger, *see* page 130.

Muligi patches consist of several coral banks, with depths of from 5 to 10 fathoms (9^{m}1 to 18^{m}3) over them, the easternmost of which, with a depth of 8 fathoms (14^{m}6) over it, lies about 20 miles westward of Muligi islands (page 74); these patches may have less depths over them. Numerous reefs, with depths of from one to 2 fathoms (0^{m}3 to 0^{m}6) over them, are reported to lie westward of them.

Chart 287.

Two 5-fathom (9^{m}1) patches lie about 6½ miles south-south-eastward of the easternmost of the Muligi patches.

Monmouth shoals, about 16½ miles south-westward of Muligi islands, consist of a group of five detached coral shoals, with depths of from 2¼ to 4½ fathoms (4^{m}1 to 8^{m}2) over them, with deep water between them.

Mambahenauhan, an islet 145 feet (44^{m}2) high, of brown rock, with brushwood, and small trees on its summit, lies 21½ miles southward of Muligi islands; it is steep-to and may be approached to a distance of half a mile.

Coast.—The north-east coast of Borneo, between the point abreast Silk island, and the northern entrance point of Sandakan harbour, about 90 miles south-eastward, is generally low, densely wooded, intersected by numerous rivers and streams, and for a considerable distance offshore the coast is fronted by numerous coral reefs.

Chart 1650.

Bankoka hill (*Lat. 6° 53′ N., Long. 117° 13′ E.*), a prominent wooded hill, 587 feet (178^{m}9) high, lies about 9 miles south-south-eastward of Inaruntang point, and 1½ miles from the coast.

Off-lying islands and dangers. — Beacons. — Mandiralla, a densely-wooded island, with the tops of the trees about 144 feet (43^{m}9) high, lies on the south-western side of the recommended track (shown by a pecked line on the chart), about 8 miles east-south-eastward of Silk island; it lies on a coral reef which extends about 6 cables from its northern side, and one mile north-eastward from the eastern side. Foul ground extends about 3½ miles south-eastward and 4½ miles south-south-eastward from Mandiralla.

Bush island, about 7 miles southward of Mandiralla, is a sandy cay, on which are a few bushes, about 10 feet (3^{m}0) high; it lies near the middle of a coral reef.

Between Bush island (*Lat. 6° 49′ N., Long. 117° 21′ E.*) and Bankoka hill is Tanj Bungaan, a densely wooded island; reefs extend 1½ miles northward and eastward from the island. There is much foul ground between Mandiralla, the coast of Bankoka, Tanj Bungaan and Bush island.

Kukuban, a sand cay, covered with trees about 70 feet (21^{m}3) high, lies on the south-western part of a coral reef, situated close to the north-

Charts 967, 2660b, 1263.

Chart 1650.

eastern side of the recommended track, about 4 miles eastward of Mandiralla. About one mile south-south-eastward of Kukuban is a rock, awash, marked by a beacon. A rock, awash, but difficult to distinguish, lies 2 miles south-south-eastward of Kukuban. Merlin rock, apparently nearly awash, and dark coloured, lies 7 cables eastward of the rock marked by the beacon. A shoal, with a depth of 1½ fathoms ($2^{m}7$) over it, lies one mile south-south-eastward of the beacon, and a 3½-fathom ($5^{m}9$) patch lies about 2 cables farther in the same direction. A sand cay on a coral reef, and a coral patch lie 1¾ miles east-south-eastward, and about 2½ miles south-eastward, respectively, of Kukuban; these are easily distinguished from aloft.

Tibakkan, a sand cay covered with trees, about 108 feet ($32^{m}9$) high, lies about 3½ miles eastward of Kukuban. In 1934, a vessel with a draught of 13½ feet ($4^{m}1$), reported striking an obstruction 8 cables south-westward of Tibakkan. Dangers lie within 1¼ miles north-eastward, and two coral reefs lie about 1½ miles north-westward of Tibakkan.

Tambulian, about 70 feet ($21^{m}3$) high to the tops of the trees, lies on a reef 2¼ miles northward of Tibakkan. Bu a ning, a sand cay, situated on the southern edge of a reef, lies about 2¼ miles eastward of Tambulian. These sand cays and the two coral reefs mentioned in the preceding paragraph form the south-eastern boundary of the Mallawallé Eastern dangers, *see* page 119.

Mosquito rock, with a depth of 3 feet ($0^{m}9$) over it, and steep-to, lies about one mile south-south-westward of Bu a ning sand cay.

Tigabu, about 2½ miles southward of Tibakkan, is an island with a flat grassy summit and sides, fringed by a reef which extends about 6½ cables north-westward. Detached reefs, on which are several sand cays, extend about 3½ miles east-north-eastward from Tigabu. *See* view facing page 118.

Minna reefs, reported in 1877, but which have not been examined, are charted with a depth of 3 feet ($0^{m}9$) at each end and 1½ fathoms ($2^{m}7$) between; they lie about 8½ miles north-eastward of Tigabu. The area included between Minna reefs and Muligi patches, about 20 miles eastward, and between Pudsey Dawson dangers and Billean North dangers, about 14 miles southward, has not been examined. This area is enclosed by a pecked line on the chart, within which no vessel should enter. Close inside the southern edge of this area is Schuck reef, with a depth of 3½ fathoms ($6^{m}4$) over it.

Coast.—Between the point situated eastward of Bankoka hill and Tanjong Kinulubaltan, 22 miles south-eastward, the coast has not been surveyed. About 2½ miles northward of the latter point is Tanjong Pabahannan, the south-eastern point of Simaddel or Jambongon island, and between the north-western side of this island and the coast of Borneo westward of it, is Paitan bay, which has been only partially examined; it is encumbered with numerous islets and reefs and is apparently shallow.

Simaddel island.—On the western side of Simaddel island is an inlet, the entrance to which lies between North-east bluff (*Lat. 6° 44′ N., Long. 117° 23′ E.*), 442 feet ($134^{m}7$) high, the north-western point of the island, and South-west bluff, about 460 feet ($140^{m}2$) high, about 5 miles south-westward. The land at the head of the inlet, which is not defined, is low and densely wooded; the shores of the inlet and of

Charts 287, 967, 2660b, 1263.

Chart 1650.

the southern and eastern sides of the island are wooded. The northern point of the island rises to a hill about three-quarters of a mile within the point. There is a village on the south-eastern side of the island and at about one mile on either side of it is a cliff, 20 feet ($6^{m}1$) high, the western of which is red.

Simaddel island is separated from the coast of Borneo on the south by a channel three-quarters of a mile wide at its narrowest part; it has not been completely examined. *See* also on page 133.

The western side of the island appears to be clear of dangers, but the water is shallow, there being a depth of 2 fathoms ($3^{m}7$) in the entrance to the inlet mentioned above. A sand patch and reef, which dry 4 feet ($1^{m}2$), lie 2¼ miles west-south-westward of North-east bluff.

Anchorage.—Directions.—Anchorage may be obtained, in a depth of 5¼ fathoms ($9^{m}6$), mud, with the summit of North-east bluff bearing 156°, and the northern extremity of Simaddel island, 095°. The approach to the anchorage from northward is by a clear passage about 3 miles wide between the foul ground south-eastward of Mandiralla and Bush island on the west and the dangers extending about 5½ miles northward from Simaddel island on the east; the depths decrease gradually from 11 and 12 fathoms ($20^{m}1$ and $21^{m}9$) in the channel outside to the anchorage, a distance of about 7 miles.

A vessel approaching the above anchorage from north-westward should pass south-westward of Kukuban, and when it bears 000°, keep it astern on that bearing until the south-eastern extremity of Tigabu bears 067°, when she should steer 199° which will lead to the anchorage.

From eastward she should pass southward of Tigabu, and when its south-eastern extremity bears 067°, should keep it astern on that bearing until the trees on Kukuban bear 000°, or the summit of North-east bluff bears 187°, when she should steer 199° for the anchorage.

Directions for the passage between Mallawallé channel and Sandakan are given on page 138.

Off-lying islands and dangers.—Beacons.—Light-buoy.—The off-lying islands and reefs, between which a vessel must pass on her way from Mallawallé channel, have been surveyed to a distance of from 13 to 18 miles from the coast; beyond this distance there is the unexplored region extending northward to Pudsey Dawson dangers. *See* page 130.

From Simaddel island reefs and dangers extend northward and north-eastward to a distance of about 5½ miles and east-north-eastward for 8 miles. On these reefs are many sand cays, two of which, Mabahók and Kalangaan, lying 1¾ miles north-north-westward and 2¼ miles north-eastward, respectively, of the northern point of the island, are especially noticeable, the former being covered with trees, 84 feet ($25^{m}6$) high, and the latter with bushes 15 feet ($4^{m}6$) high.

Sipindung (*Lat. 6° 52′ N., Long. 117° 33′ E.*), a sand cay about 15 feet ($4^{m}6$) high, on which there is only a small quantity of grass, lies on the western side of a coral reef, 4½ miles east-south-eastward of Tigabu. Shoals, with depths of 2 and 3 fathoms ($3^{m}7$ and $5^{m}5$) over them, lie about 6 cables southward and south-westward of the cay; it was reported, in 1936, that the shoal southward of the cay was extending south-westward, and that there was less depth over it than is shown on the chart; dangers lie within 1¼ miles north-westward and

Charts 287, 967, 2576, 2660b, 1263.

Chart 1650.

2½ miles northward of this cay. Between these dangers and those lying east-north-eastward of Tigabu there is a passage clear of dangers 1½ miles wide.

About 1½ miles south-westward of Sipindung cay there is a group of reefs, the north-easternmost of which is marked by an iron beacon, surmounted by a black cone. A 3½-fathom ($6^{m}4$) patch lies about 7 cables east-south-eastward of the beacon.

Between these dangers and those lying about 6 cables south-westward and southward of Sipindung cay, mentioned above, there is a passage clear of dangers about 6½ cables wide, through which the recommended track from Mallawallé channel passes.

A shoal, with a depth of less than 6 feet ($1^{m}8$) over it, lies about one mile south-westward of the beacon just mentioned. A coral reef lies on the north-eastern side of the track, about 1½ miles south-eastward of Sipindung cay.

Sandy island, a small sand cay which sometimes covers, lies near the middle of a coral reef, 4¼ miles south-eastward of Sipindung. Dangers lie within one mile westward of the island. A framework tripod beacon, 35 feet ($10^{m}7$) high, stands on the eastern edge of the reef on which Sandy island lies.

A 4-fathom ($7^{m}3$) coral patch lies three-quarters of a mile south-south-eastward of Sandy island beacon, and two patches, with depths of 7 and 4 fathoms ($12^{m}8$ and $7^{m}3$) over them, lie 1¼ and 2 miles, respectively, south-westward of the beacon, the recommended track passing between the two patches.

Leonan, a sand cay which sometimes covers, lies 5¼ miles southward of Sandy island. It is situated on, and about 1½ miles from the north-eastern end of, an extensive chain of reefs, which at this part extends 8 miles north-eastward from the eastern side of Simaddel island. There are four other small cays on this chain of reefs.

A 2-fathom ($3^{m}7$) patch lies 2 miles north-north-westward of Leonan.

A small coral reef lies about three-quarters of a mile north-eastward of the recommended track and 4½ miles south-south-eastward of Sandy island; it is marked on its south-eastern side by an iron pole beacon surmounted by a red cylinder. Between this reef and that on which Leonan cay lies there is a channel apparently clear of dangers, about 2 miles wide. About one mile north-eastward of this beacon there are some coral patches which dry.

Sedgeman rock, with a depth of about 4½ fathoms ($8^{m}2$), coral, over it, lies about 3½ cables south-westward of the recommended track on chart 1650, and about 7¾ miles east-south-eastward of Leonan cay.

Billean North dangers are a group of coral reefs, with a least known depth of 1½ fathoms ($2^{m}7$) over them, lying nearly 8 miles south-eastward of the beacon on Sandy island (*Lat. 6° 49′ N., Long. 117° 37′ E.*). As these dangers have not been completely examined they should be carefully avoided.

Billean is an island or cay, on which there are a few bushes, 38 feet ($11^{m}6$) high, situated about 12 miles south-eastward of Leonan cay and about 10 miles from the north-east coast of Borneo. It is surrounded by coral reefs and dangers, which lie within 3¾ miles north-eastward of it. A cay lies a quarter of a mile south-eastward of Billean.

Between Billean and the coast of Borneo south-westward of it, there is a chain of reefs, on which there are two cays and about midway

Charts 287, 967, 2576, 2660b, 1263.

Chart 1650.

is Tagipil, a densely wooded and prominent islet, 184 feet ($56^{m}1$) high to the tops of the trees; Banku ru an cays, two small wooded cays, about 50 feet ($15^{m}2$) high to the tops of the trees, lie on the chain about 2 miles south-westward of Tagipil islet.

A sand cay, about 4 feet ($1^{m}2$) high, lies on a coral reef, about 5 miles south-south-eastward of Billean.

A conical light-buoy, painted in red and yellow vertical stripes, and exhibiting a *white flashing* light *every five seconds*, is moored on the recommended track, 4½ miles north-eastward of Billean.

A shoal, reported in 1918, by s.s. *Kinabalu*, lies 4¼ miles north-eastward of Billean, and half a mile south-westward of the recommended track.

Billean South dangers are a group of coral reefs lying from 7 to 11 miles east-north-eastward of Billean; they consist of a 2½-fathom ($4^{m}6$) patch, about 9 miles north-eastward of Billean; Sunbeam rock, with a depth of 3 fathoms ($5^{m}5$) over it, 7 miles east-north-eastward of Billean, with another 3-fathom ($5^{m}5$) patch about 1¼ miles farther in the same direction; Paknam shoal, with a depth of less than 6 feet ($1^{m}8$) over it, 3 miles eastward of the 3-fathom ($5^{m}5$) patch; and a 3¼-fathom ($5^{m}9$) patch, about 10 miles eastward of Billean. All these shoals are steep-to and probably have less depths over them. The recommended track shown on the chart has been followed with safety, but in such reef-strewn waters other dangers not charted may exist.

Marchesa bay.—Dangers.—Marchesa bay is situated eastward of Simaddel island and is contained between the chain of reefs extending east-north-eastward from that island and the chain of reefs connecting Billean with the coast of Borneo.

Between these chains of reefs the bay is from 10 to 12 miles wide, with depths in the entrance of from 11 to 17 fathoms ($20^{m}1$ to $31^{m}1$), over mud or mud and shells, decreasing gradually south-westward towards the shore, off which sand and reefs dry from a half to 1½ miles, and to 2¾ miles in the south-eastern part of the bay.

In the south-western part of the bay, between Tanjong Kinulubaltan and the south-eastern side of Simaddel island, is the entrance to the passage leading southward of that island. About 5 miles south-south-westward of Tanjong Kinulubaltan (*Lat. 6° 38′ N., Long. 117° 31′ E.*) is the entrance to Sungei Paitan, in which there are three islands, 4½ miles westward of which is a larger wooded island. An extensive bank of sandy mud, which dries, extended, in 1881, across the mouth of the river, the northern edge of the bank then lying one mile southward of the red cliff on the southern side of Simaddel island, *see* page 130.

A spit extends 2 miles north-eastward from Tanjong Kinulubaltan; the inner part dries for 1¼ miles, thence to the extremity there are depths of from 3 to 4 feet ($0^{m}9$ to $1^{m}2$) over it. Beyond this and about 4 miles from the point in the same direction, a bar, about one mile across, with a depth of 2½ fathoms ($4^{m}6$) over it, in 1881, fronted the entrance to the channel. Within the bar there was a channel about 4 cables in width, with depths of from 4 to 10 fathoms ($7^{m}3$ to $18^{m}3$), leading along the south-eastern side of Simaddel island as far as the red cliff, beyond which it appears to become shoal. Southward of this channel are shallow banks.

A rocky shoal, with a depth of less than 6 feet ($1^{m}8$) over it, with a

Charts 287, 967, 2576, 2660b, 1263.

Chart 1650.

4¼ fathom (7^{m}8) patch close eastward of it, lies about 5¾ miles eastward of Tanjong Kinulubaltan. A reef, which dries, lies about 1¼ miles south-south-eastward, and three similar reefs lie within a distance of about 2¾ miles south-south-westward of the rocky shoal. There is a cay on the southernmost reef.

Charts 1650, 287.

Coast.—Between Tanjong Kinulubaltan and Tanjong Siasib, 18 miles south-eastward, and thence to Tanjong Niug, 11½ miles southward, the coast is wooded with casuarina trees, which, in some places, form peculiar clumps. Tanjong Siasib is the eastern extremity of Torongohok island, which lies close off the coast.

Charts 1650, 1649.

Off-lying islands and dangers.—Beacon.—Lankayan, about 11 miles south-eastward of Billean, is an islet covered with trees, about 100 feet (30^{m}5) high, lying on a coral reef, which extends 1¼ miles southward, and about 6½ cables northward and eastward.

Shoals, with depths of from 3½ to 4 fathoms (6^{m}4 to 7^{m}3) over them, lie within 2 miles south-westward of Lankayan, and a shoal, with a depth of less than 6 feet (1^{m}8) over it, lies about one mile north-westward. A small detached reef lies close eastward of the eastern extremity of the reef on which Lankayan lies, and a shoal, with a least depth of 3¼ fathoms (5^{m}9) over it, lies about 3 cables farther eastward.

A coral reef, the southern half of which dries, and is steep-to, lies 4 miles westward of Lankayan.

A 5-fathom (9^{m}1) patch lies about 1¾ miles north-north-westward of Lankayan, and from this patch other reefs and shoals, the positions of which can best be seen on the chart, extend 3 miles north-eastward to within half a mile south-westward of the recommended track. The two shoals lying nearest to the track were reported, in 1937, to be extending north-eastward. Between these shoals there are depths of from 12 to 15 fathoms (21^{m}9 to 27^{m}4).

Chart 1650.

A shoal was reported, in 1948, to lie on the north-eastern side of the track, about 5 miles north-north-eastward of Lankayan, and another shoal, with a depth of 5 fathoms (9^{m}1) at its south-eastern end, was reported, in 1933, to lie about 5¾ miles north-eastward of Lankayan.

Kechil reef, a coral patch, with a depth of 4¼ fathoms (7^{m}8) over it, and steep-to, lies about 7 miles north-eastward of Lankayan. A 5½-fathom (10^{m}1) patch, the existence of which is doubtful, is charted about one mile southward of Kechil reef.

Charts 1650, 1649.

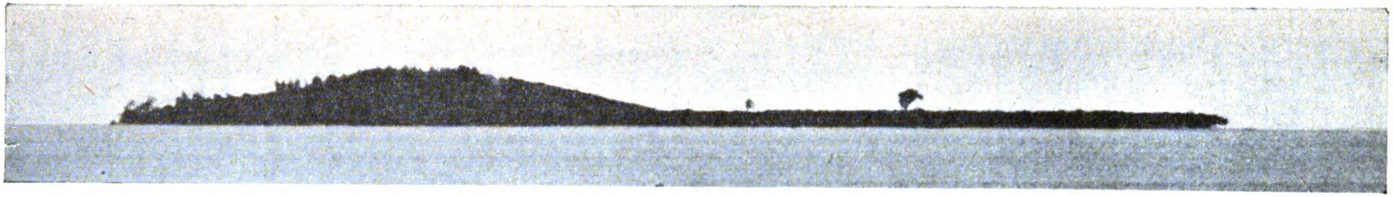
Kestrel shoal (*Lat. 6° 30′ N., Long. 117° 59′ E.*), with a least depth of 2 fathoms (3^{m}7) over it, lies on the south-western side of the track, 4 miles eastward of Lankayan.

Chart 1649.

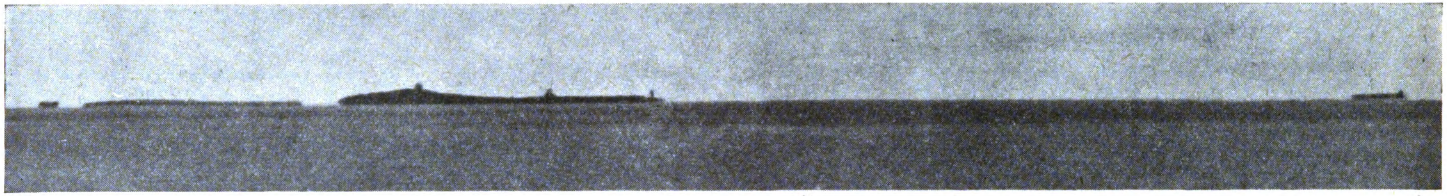
Foul rocky ground, with depths of less than one fathom (1^{m}8) over it, lies within 3 miles south-westward of Lankayan. A beacon, consisting of a staff surmounted by a black cone, marks the northern edge of this foul ground. There is also foul ground about 2 miles southward of the island.

Two shoals, with depths of 1½ and 1¼ fathoms (2^{m}7 and 2^{m}3) over them, lie about 6½ miles south-westward of Lankayan.

To face page 134.

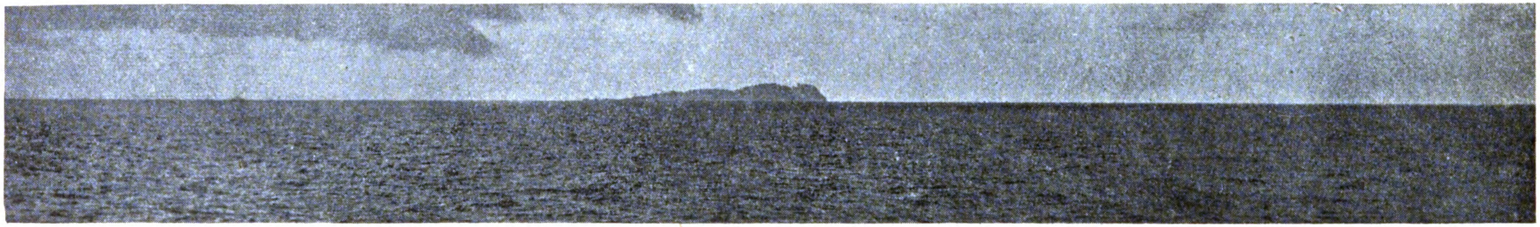


Boaan island from north-westward, distant 3½ miles.
(*Original dated* 1918.)



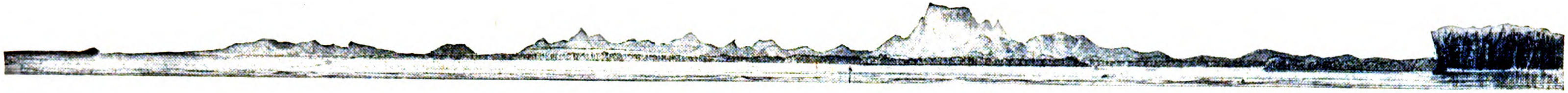
Great Bakkungaan I. *Lihiman I.,*
from about 3½ *miles north-westward.* *Silingaan.*

Inner route between Mallawallé island and Sandakan.
(*Original dated* 1918.)



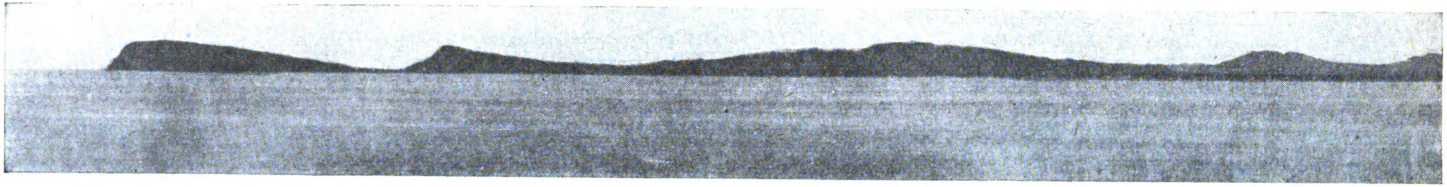
Taganak island, bearing 318°, distant 9 miles.
(*Original dated* 1918.)

To face page 135.

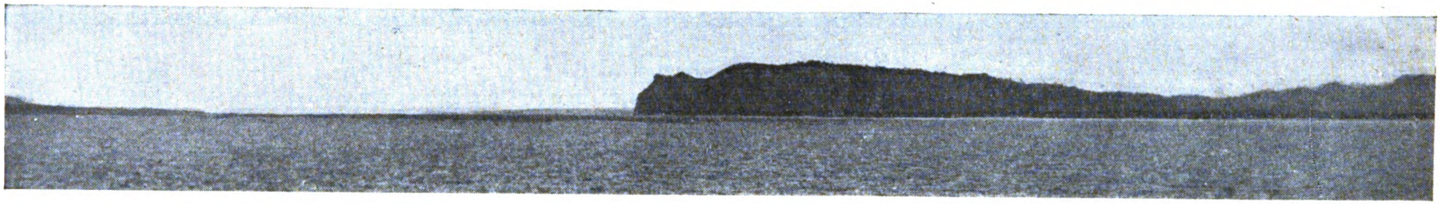

Torongohok I.
Bongaya river.
Mt. Kinabalu.
Tanjong Niug.

Western shore of Labuk bay.

(*Original dated* 1883.)



Berhala I., from about 11 miles northward.



Summit of Berhala I., bearing 220°, distant **6½** ***miles.***

Two views of the northern approach to Sandakan.

(*Original dated* 1918.)

Chart 1649.

Islands and dangers in approach to Labuk bay.—Si ba ung, on which there are a few bushes, about 35 feet (10^{m}7) high, lies 13½ miles south-south-eastward of Lankayan.

Bo aan, 192 feet (58^{m}5) high, is the northernmost of a chain of islands which extends about 14 miles northward from Tanjong Pandaras, the south-eastern entrance point of Labuk bay ; it is fringed by a coral reef, which extends about 3½ cables from its north-western side ; the lower parts of the island are densely wooded. *See* view facing page 134.

Flying Fish rock, with a depth of 1¾ fathoms (3^{m}2) over it, and steep-to, lies 2½ miles eastward of Bo aan. Another shoal, with a depth of 1¾ fathoms (3^{m}2) over it, and steep-to, lies about 1¾ miles east-south-eastward of Bo aan.

Lihiman, an island, 172 feet (52^{m}4) high, and densely wooded, lies 2¾ miles southward of Bo aan ; it is fringed by a coral reef, which extends 6½ cables north-eastward, and on which is an islet, about 30 feet (9^{m}1) high. *See* view facing page 134. Lihiman and Bo aan are mud volcanoes, which appear to have been active previous to about 1880.

Langaan, a wooded islet, 120 feet (36^{m}6) high, lies on the south-western edge of an extensive coral reef, situated 4½ miles east-south-eastward of Lihiman. On the edge of the reef, about 4 cables eastward of Langaan, is a sandbank, 2 feet (0^{m}6) high. Several patches, with depths over them of from 3¼ to 10 fathoms (5^{m}9 to 18^{m}3), lie with the shoalest part about 3 miles north-north-eastward of Langaan.

Johnston rock, a coral patch, with a depth of 1¼ fathoms (2^{m}3) over it, lies 2¼ miles north-eastward of Langaan ; it is situated near the middle of a bank, with depths of less than 10 fathoms (18^{m}3) over it. A 6-fathom (11^{m}0) patch and a 6¾-fathom (12^{m}3) patch lie about 1¼ miles eastward and one mile north-eastward, respectively, of Johnston rock. A 9-fathom (16^{m}5) patch lies about 4 miles east-north-eastward of Johnston rock.

A coral patch, with a depth of 4 fathoms (7^{m}3) over it, and possibly less, lies 4½ miles east-south-eastward of Langaan ; a 4½-fathom (8^{m}2) patch lies about 3 cables north-north-westward of the coral patch. A 9-fathom (16^{m}5) patch lies 4¼ miles eastward of Langaan. A 6¼-fathom (11^{m}4) patch lies about one mile west-north-westward of Langaan.

Great Bakkungaan and Little Bakkungaan are two wooded islands fringed with coral, about 190 and 157 feet (57^{m}9 and 47^{m}8) high, lying, respectively, about 1¾ and 3 miles south-westward of Langaan. (*See* view facing page 134.) Detached coral reefs and dangers lie within 2 miles north-westward and one mile eastward and westward of Great Bakkungaan. A shoal, with a depth of 5¾ fathoms (10^{m}5) over it, lies 1½ miles west-north-westward of the same island. A coral patch, with a depth of 8 feet (2^{m}4) over it, was reported, in 1894, by s.s. *Petrel* to lie in the channel between Langaan and Great Bakkungaan.

Silingaan (*Lat. 6° 11′ N., Long. 118° 04′ E.*) is a wooded islet, 139 feet (42^{m}4) high, with a prominent clump of trees rising above the general level of the trees on the islet, and fringed with coral, lying 3¼ miles west-south-westward of Great Bakkungaan. About 6½ cables eastward of Silingaan is a coral reef, on the south-eastern edge of which is a sand cay, which dries about 8 feet (2^{m}4). A shoal, with a least depth of 1¼ fathoms (2^{m}3) over it, lies about half a mile westward of Silangaan.

Charts 2576, 2660b, 1263.

Chart 1649.

In 1932, the s.s. *Goshu Maru*, with a draught of 20 feet (6m1), reported grounding on a coral patch about 1½ miles eastward of Silingaan.

Gulisaan, an islet with a prominent clump of trees, 76 feet (23m2) high, on it, lies on the southern edge of a coral reef, about 1¼ miles southward of Silingaan.

Libarran, a wooded island, about 140 feet (42m7) high, lies about 3¼ miles north-eastward of Tanjong Pandaras. From the island a coral reef extends 1¼ miles eastward, with Black rock, 8 feet (2m4) high, near its outer end, and White rock, 6 feet (1m8) high, 3½ cables west-south-westward of Black rock; also westward for about 6½ cables, with Round islet close to its extremity. About 2¼ cables north-westward of Round islet is a rock, which dries 2 feet (0m6), and 4 cables north-eastward is Tree rock, 20 feet (6m1) high.

Clotilde rock, a small coral reef, 2 feet (0m6) high, and steep-to, lies about 18 miles east-south-eastward of Bo aan. A shoal, with a depth of 1¾ fathoms (3m2) over it, lies about half a mile south-westward of Clotilde rock.

Chart 287.

Laurel rock, 6 feet (1m8) high, lies about 7½ miles south-eastward of Clotilde rock.

Baguan is a densely wooded island, 228 feet (69m5) high, lying on a coral reef about 3½ miles south-westward of Laurel rock; a bank extends about 2¼ miles east-north-eastward from the northern extremity of the island. In 1937, the passage between Baguan island and Laurel rock was reported to be clear, but it is not recommended.

In 1907, s.s. *Progress* struck a pinnacle rock, over which there was a depth of 3 fathoms (5m5), situated about 2 miles north-westward of Baguan.

Chart 1649.

Taganak, an island, about 450 feet (137m2) high, and wooded, lies about 20 miles eastward of Tanjong Pandaras; it is fringed by a reef, which extends about 4 cables offshore in places. *See* view facing page 134.

Taganak patches, with depths of from 4½ to 10 fathoms (8m2 to 18m3) over them, lie with the shoalest part 4¼ miles north-westward of Taganak. Tide-rips occasionally occur in the vicinity. A 4¼-fathom (7m8) patch lies about 6¾ miles west-north-westward of Taganak.

Gubbins rock, with a depth of 6 feet (1m8) over it, and steep-to, lies 7 miles west-south-westward of Taganak.

About 2½ miles south-westward of Gubbins rock, and in the northern approach to Sandakan harbour, there is a coral shoal, with a depth of 3 fathoms (5m5) over it.

Light.—A light is exhibited, at an elevation of 486 feet (148m1), from a tower, 38 feet (11m6) in height, on the summit of Taganak (*Lat. 6° 05′ N., Long. 118° 19′ E.*). This light was extinguished in 1946.

Chart 287.

Labuk bay.—Islets and dangers.—Labuk bay, entered between Pulau Pura-pura, situated close north-eastward of Tanjong Niug, and Tanjong Pandaras, 19½ miles south-eastward, is, over the greater part, encumbered with numerous sandbanks, which render navigation dangerous even for boats, but there is a narrow channel on the north-western side leading to Bongaya river, and one on the south-eastern

Charts 2576, 2660b, 1263.

Chart 287.

side affording a passage to Labuk river in the south-western corner of the bay. The western side of the bay is densely wooded, with numerous creeks, and the south-eastern side is fringed by islets and rocks extending some distance offshore. There is a village on Pulau Tetabuan, and another on the islet close westward of Pulau Linkabo, both in the south-western part of the bay.

Tanjong Niug is a well-defined point covered with trees, about 150 feet (45^{m}7) high. (*See* view facing page 135.) About 8 miles north-westward of the point are Quoin and Flat hills, 650 and 630 feet (198^{m}1 and 192^{m}0) high, respectively.

Chart 1649.

Northward of Tanjong Pandaras (*Lat. 6° 04′ N., Long. 117° 59′ E.*) are some low islets, which are merely clumps of mangroves on the fringing reef; Pulau Bankawan, the outer one, is 100 feet (30^{m}5) high to the tops of the trees. Pulau Tikus, a wooded pyramidal island 234 feet (71^{m}3) high, lies about one mile west-north-westward of Tanjong Pandaras; about half a mile northward of Pulau Tikus is a rock, which dries 8 feet (2^{m}4).

Chart 287.

Pulau Gusong, a small sandy islet, about 2 feet (0^{m}6) high, lies at the north-eastern extremity of a large sandbank near the middle of the bay, about 10 miles westward of Tanjong Pandaras; being devoid of trees, it is difficult to distinguish. A shoal, which dries 3 feet (0^{m}9), lies 2¼ miles north-eastward of Pulau Gusong.

A chain of islets, of which Torongohok is the northernmost, lies in the south-western part of the bay. The northern part of Torongohok is covered with casuarina trees, about 140 feet (42^{m}7) high, and is a prominent object when approaching from north-eastward.

The mouth of Labuk river, which for a few miles is named the Kolapis river, lies 21 miles south-westward of Tanjong Pandaras; the entrance is 5½ cables wide with a depth, in 1883, of 5 fathoms (9^{m}1). Beluran, on the southern bank of the Kolapis river, is a Government station where the District officer resides.

Charts 1649, 287.

Directions.—The following directions were compiled during the survey, in 1883, and as it is possible changes in the banks may have taken place since then, vessels should proceed with caution.

A vessel from eastward, having passed Gubbins rock, should steer to pass between Libarran and Pulau Bankawan (*Lat. 6° 05′ N., Long. 118° 00′ E.*), avoiding the sunken rocks which lie off the southern side of Libarran; when Round islet is in line with Gulisaan, bearing 058°, she should keep these islets in line, astern, on that bearing, which leads north-westward of the islets and rocks north-westward of Tanjong Pandaras, and over the flats, in a depth of 1½ fathoms (2^{m}7). When the depths increase she should steer to pass about three-quarters of a mile north-westward of Tanjong Semawang, about 15½ miles south-westward of Tanjong Pandaras; thence to the mouth of the Labuk river there are depths of from 3¼ to 5 fathoms (5^{m}9 to 9^{m}1). The least depth in the approach is between Pulau Gusong and the mouth of the Sungei Gum-gum, about 7 miles south-eastward.

Tidal streams.—The maximum rate of the ebb stream observed in Labuk river was 3 knots. The tidal influence is felt for a distance of about 20 miles from the entrance.

Charts 2576, 2660b, 1263.

Chart 1649.

Coast.—The coast between Tanjong Pandaras and Tanjong Papat, about 16 miles south-eastward, is low, densely wooded, and intersected by numerous rivulets. It is fringed by a bank, depths of 3 fathoms (5^m5) being found as far as 5 miles offshore.

Nunuyon Laut and Nunuyon Derat are two low wooded islands lying on the coastal bank, about 4 miles north-north-westward of Tanjong Papat (*Lat. 5° 51′ N., Long. 118° 08′ E.*).

Charts 950, 1649.

Berhala is an island lying on the north-western side of the entrance to Sandakan harbour. The northern part of it is low, the southern rises in two prominent hills, 591 and 549 feet (180^m1 and 167^m3) high, these hills slope gradually westward, but their eastern faces are imposing precipices with two conspicuous light red streaks running perpendicularly from the top to the bottom, by which the island may be identified. *See* view on chart **1649**, also views facing page 135.

Charts 950, 1649, 1650.

Directions.—The route between Mallawallé channel and Sandakan, generally used by local vessels, is as follows :—

After passing north-eastward of Passage reef beacon at a distance of about three-quarters of a mile keep the south-western extremity of Kukuban in line with the summit of Tigabu, bearing 121° ; this is a good mark and easily picked up. When nearly up to Kukuban, follow the pecked track shown on the chart westward and southward of the reefs between Kukuban and Tigabu, and thence north-eastward of the buoy north-eastward of Billean ; thence steer to pass between Kestrel shoal and Kechil reef ; thence steer for Taganak bearing 145° ; pass between Taganak island and Taganak patches and then steer for a position about 10 miles north-eastward of the southern extremity of Berhala, thence for the cliff on the south-eastern side of Berhala, situated about 3 cables north-eastward of the southern point of the island, bearing 221°, which leads over the flats in the approach to Sandakan harbour in a depth of not less than 4 fathoms (7^m3) ; when the bar is crossed and depths of 5½ or 6 fathoms (10^m1 or 11^m0) are obtained, alter course slightly southward and steer to pass 4 or 5 cables south-eastward of the southern end of Berhala (*Lat. 5° 51′ N., Long. 118° 09′ E.*), and thence to the anchorage, avoiding Atjeh rock. *See* view facing page 135.

Charts 1650, 1649.

Caution.—The track shown by the pecked line on the chart has been followed with safety, but there may be less depths than shown on some of the shoals and in such reef-strewn water other dangers not charted may exist, as is borne out by several dangers having been reported since the original surveys in 1881 and 1883.

It should be borne in mind also, that no reliance can be placed on the position of sand cays which have no vegetation on them ; the action of the sea frequently causes them to shift considerably, and even disappear.

The beacons are sometimes difficult to make out, but are very seldom washed away.

Tidal streams.—In Mallawallé channel the east-going and west-going streams run at a rate of about 2½ knots at springs.

Off the coast between Mallawallé channel and Sandakan no regular

Charts 1650, 1649.

tidal stream was perceptible during the survey, but when the North-east monsoon blew steadily there appeared to be a constant set north-westward.

SANDAKAN HARBOUR.—Sandakan harbour is about 1¼ miles wide at its entrance between Berhala and Tanjong Aru, south-eastward of it. From here it gradually widens, forming a spacious basin northward of Pulau Bai, which constitutes the usual anchorage. The harbour extends southward and westward of Pulau Bai to a distance of 15 miles from the entrance, but the only part accurately surveyed is that northward of Pulau Bai and the northern approaches to Sapagaya bay, situated on the southern shore. Several rivers flow into the harbour.

The eastern side of the harbour entrance is formed by a large island, low and densely wooded, and separated from the main coast by a channel named Trusan Duyon. From the shore eastward of the entrance an extensive flat projects seaward, the northern extremity of which, in a depth of 3 fathoms (5^{m}5), lies 7 miles north-eastward of Tanjong Aru.

Chart 950.

The northern shore rises to many summits prominent from seaward, of which the highest is Bukit Mekarah or Three-peaked hill, 850 feet (259^{m}1) high, situated about 2¼ miles westward of Tanjong Papat (*Lat. 5° 51′ N., Long. 118° 08′ E.*). These hills slope gradually on their northern and western sides, and are generally steep on their southern and eastern sides. The gaol, 6½ cables south-westward of Tanjong Papat, is brown with a red roof, and is conspicuous, with a flagstaff on the side of the hill about three-quarters of a cable north-westward of it.

Bathing is dangerous, as crocodiles abound.

Chart 1649.

Bar.—A bar of mud, about 3¼ miles wide within the 5-fathom (9^{m}1) lines, with a least depth of 3¾ fathoms (6^{m}9) over it, but with 4 fathoms (7^{m}3) on the track recommended, lies from 6 to 9½ miles north-eastward of the southern point of Berhala. In 1933, a vessel with a draught of 29 feet (8^{m}8) entered the harbour.

Chart 950.

Dangers. — Light-buoy. — Beacon. — Atjeh rock, with a depth of 2½ fathoms (4^{m}6) over it, and marked on its southern side by a conical light-buoy, painted in white and black bands, and exhibiting a *white flashing* light *every three seconds*, lies about 3¼ cables east-south-eastward of the Government wharf.

Allard bank nearly fills the bight between the Government wharf and Pavitt point, about 3 miles south-westward, leaving a small space at the north-eastern end, where there are depths of from 1¼ to 2¾ fathoms (2^{m}3 to 5^{m}0).

Elton bank is an extensive area of shallow water extending about 1¾ miles northward from Pulau Bai.

A white tripod beacon, 20 feet (6^{m}1) high, surmounted by a black cone, stands on a rock, 2 feet (0^{m}6) high, near the eastern extremity of the rocks which extend 2 cables eastward from Pulau Bai.

Chart 1649.

Borneo rock, with a depth of 4 feet (1^{m}2) over it, lies about 2 miles

Chart 1649.

southward of the beacon situated off the eastern extremity of Pulau Bai.

Anchorage.—The most convenient anchorage is about 3½ cables southward of the Government wharf, in a depth of 7 fathoms (12^m8), mud.

Tidal streams.—In Sandakan harbour the tidal streams turn at the times of high and low water by the shore, the out-going stream attaining a maximum rate of 2 knots, and the in-going, 1½ knots. Alongside the wharf the stream frequently sets in the reverse direction to that in the harbour.

Chart 950.

Sandakan.—Sandakan, formerly Elopura, stands on the northern shore of Sandakan harbour, about three-quarters of a mile southwestward of Tanjong Papat. Between Fort Pryer, situated at the eastern end of the town, and the Government wharf, and on rising ground are the Government offices, &c. There is an Anglican and a Roman Catholic church, and a Government hospital for Europeans. There is a European cemetery.

Considerable reclamation has been carried out along the foreshore in the vicinity of the wharf and westward of the native village.

All vessels carrying goods must load and discharge at the Government wharf, unless written permission to do so elsewhere has been obtained from the Superintendent of Customs.

The quarantine and leper stations are situated towards the southern end of the island of Berhala (*Lat. 5° 51′ N., Long. 118° 09′ E.*), the former on the western, and the latter on the eastern side.

In 1947, the population was 13,723.

Wharf.—The Government wharf, built of wood, is 450 feet (137^m2) long, with a depth alongside, in 1939, of 16½ feet (5^m0) ; it was reported, in 1945, to be seriously damaged.

The landing place is inside the eastern arm. About 3 cables northeastward there is a pier, with a depth of 11 feet (3^m4) at its head.

There is a 15-ton crane, the only one available.

Tidal signals.—A tidal signal, consisting of a cone and ball, is displayed on a small mast on the centre of the Government wharf to show the state of the tide to vessels approaching it ; a cone, point down signifies in-going stream ; a cone, point up, out-going stream ; a ball, slack water.

Trade.—Most of the trade is carried on with Hong Kong and through Singapore with Europe. The exports comprise hemp, cutch, coconuts, timber, sago, tobacco, rattan, copra, rubber, and salt fish. The imports include cloth, hardware, manufactured goods of all kinds, rice, oil, sugar, provisions, machinery, flour, wines and tobacco.

Harbour facilities.—Water is laid on to the Government wharf. Fresh provisions may be obtained in small quantities.

Small repairs can be undertaken. There is a patent slip, details of which are given in Appendix I.

Communication.—Frequent communication is maintained by steamer between Sandakan and other ports in North Borneo, also with the Philippine islands, Singapore and Hong Kong.

Radio station.—There is a radio station at Sandakan. *See* page 14.

Charts 287, 2576, 2660b, 1263.

Chart 950.

Port limits.—The limits of the port are bounded by a line drawn in a 115° direction from the northern extremity of Berhala to the eastern extremity of Tanjong Aru, and include the rivers and arms of the harbour as far as navigable. 5

Climatic table.—*See* page 30.

Charts 287, 2576, 2660b, 1263.

CHAPTER V

NORTH-EAST COAST OF BORNEO FROM SANDAKAN TO MANDUL EILAND

Charts 1649, 1868.

COAST.—Between Tanjong Aru and Tanjong Unsang, about 65 miles south-eastward, and thence 10 miles southward to the entrance to Dent haven, the coast is very low alluvial land, covered with dense jungle and forest, principally casuarina trees, from 150 to 180 feet ($45^{m}7$ to $54^{m}9$) high, fronted by a narrow sandy beach. Between Tanjong Aru and the entrance to the Kinabatangan river, about 27 miles south-eastward, the coast is intersected by numerous streams, some of which are reported to lead into the river and to be navigable for boats.

Climate and weather.—*See* page 16.

Chart 1868.

Aspect.—About 22½ miles south-eastward of Tanjong Aru are the Kinabatangan hills, 963 feet ($293^{m}5$) high, which appear from seaward as a long range with a slight peak (*see* view B on chart 1868 and view on chart 2576). Aguja peak, situated about midway between the Kinabatangan hills and the coast north-eastward of them, is 638 feet ($194^{m}5$) high, and from eastward appears as a double cone. Confusion hill, about 4½ miles south-eastward of Kinabatangan hills, shows a round top from north-eastward. Notch hill, about 10 miles east-south-eastward of Confusion hill and 8½ miles inland, is 803 feet ($244^{m}7$) high, and is the most prominent hill in the vicinity of Kinabatangan river, having a sharp fall near its summit (*see* view B on chart 1868 and view on chart 2576).

Mount Hatton (*Lat. 5° 15′ N., Long. 118° 42′ E.*), 1,990 feet ($606^{m}5$) high, situated about 16 miles south-south-eastward of Notch hill, is the most prominent mountain on the coast, appearing with a sharp peak from all directions. About 7 miles westward of Mount Hatton is Ragged hill, 1,455 feet ($443^{m}5$) high, which appears from eastward as two cone-shaped hills. Mount Bagahak, 2,740 feet ($835^{m}1$) high, in the centre of a long sloping range, lies about 12½ miles south-south-eastward of Mount Hatton. *See* views A and B on chart 1868, and view on chart 2576.

Coast.—Kinabatangan river is 6 cables wide between its entrance points, with depths of from 3¾ to 5 fathoms ($6^{m}9$ to $9^{m}1$) ; on the bar, which extends 3½ miles seaward, there was a depth, in 1883, of

Charts 928, 2576, 2660b, 1263.

Chart 1868.

1½ fathoms (2^{m}7). Vessels with a draught of more than 8 feet (2^{m}4) should not attempt to cross the bar without local knowledge, as the tides are much influenced by the winds, rendering the time of high water uncertain.

Driftwood point, the eastern entrance point of the river, is wooded, and may be identified at a distance of about 15 miles, making as a sharp and well-defined point. About 5 miles inside the entrance the river leads into Dewhurst bay, in which there are depths of from less than one to 2 fathoms (1^{m}8 to 3^{m}7); the main branch here turns westward, whence it was examined in 1883, for a distance of 6 miles; depths of from 1½ to 6 fathoms (2^{m}7 to 11^{m}0) were found, and the river at this distance is 1½ cables wide, with a depth of 2½ fathoms (4^{m}6). No villages were seen.

Off-lying dangers.—Royalist rock, with a least depth of 6 feet (1^{m}8), coral, over it, near its south-western end, and steep-to, lies about 4¾ miles north-north-eastward of Driftwood point.

Nymphe reef, over which there is a depth of one foot (0^{m}3), coral and sand, lies 6 miles north-north-eastward of Driftwood point. Patches, with depths of 5¾ and 7 fathoms (10^{m}5 and 12^{m}8) over them, lie between Nymphe reef and Royalist rock. Being within the limit of discoloured water from Kinabatangan river, Nymphe reef is seldom seen, but is marked by a slight ripple; in heavy weather it breaks.

Pegasus reef, 14 miles north-eastward of Driftwood point, has a least depth of 3 feet (0^{m}9) over it, and is composed of live coral with patches of sand; it is steep-to on its southern side. Discoloured water over the reef can be discerned from aloft.

Coast.—Between Driftwood point (*Lat. 5° 39′ N., Long. 118° 38′ E.*) and the mouth of Segama river, about 13 miles south-eastward, the coast is covered with jungle, and is bordered by a belt of grass and bushes. Between the entrance points the Segama river is 5½ cables wide, with a depth, in 1883, of 2½ fathoms (4^{m}6). A shallow flat, over which there was, in 1883, a least depth of 1½ fathoms (2^{m}7) at high water springs leading to the entrance, extends about 3 miles offshore. Vessels entering should send a boat ahead, as the tides are irregular. About 2 miles inside the entrance there is an island, southward of which the river splits up into several creeks, which are narrow, with depths of from 2 to 3 fathoms (3^{m}7 to 5^{m}5).

About 8½ miles south-eastward of the eastern entrance point of Segama river is the entrance to Marowop river, which is 7 cables wide, with depths, in 1883, of from 3 to 5 fathoms (5^{m}5 to 9^{m}1) between the entrance points. On the bar in the approach to the entrance there was a depth of 1¾ fathoms (3^{m}2); caution is necessary in crossing it, as the sea breaks on it with south-easterly winds. About 3 miles inside the entrance is Evans island, where the river divides into several branches.

Tambisan island, about 9 miles eastward of the eastern entrance point of Marowop river, is of a uniform height of 60 or 70 feet (18^{m}3 or 21^{m}3), with the tops of the trees on the uncleared portion about 200 feet (61^{m}0) high. The western point is easily identified from seaward by day, but is difficult to see at night; the eastern point is low. The foreshore is covered with coconut plantations. The island is fringed by a coral reef, which extends three-quarters of a mile from its north-western side. A narrow channel, which is only navigable by small craft, separates the island from the coast of Borneo.

Charts 928, 2576, 2660b, 1263.

Chart 1868.

South-westward of Tambisan island is Tangusu bay, a shallow bight, in which there is a rock, with a depth of 4 feet (1^m2) over it, situated about one mile from the coastal reef.

The District officer from Lahat Datu visits the island occasionally.

Tidal streams.—Current.—Between Sandakan and Tambisan island the tidal streams are weak, running rarely as much as one knot.

Between Tambisan island and Dent haven (page 145) the tidal streams are more strongly marked and run at the rate of from 2 to 3 knots.

At a distance of 10 miles from the coast, during the South-west monsoon, the regular south-easterly current, of from one to 2 knots, makes itself felt, and the north-westerly set is not experienced, only a slackening of the current during the north-west-going tidal stream.

Off-lying banks and dangers.—Sunday bank, over which there is a least depth of 9 fathoms (16^m5), coral, near its north-western edge, lies 22 miles northward of Tambisan island; the depths round the bank are over 100 fathoms (182^m9).

Magpie bank, with a least depth of 9 fathoms (16^m5) over it on its south-western side, is an extensive bank of rotten coral, with its southern extremity situated about 14 miles northward of Tambisan island. The north-eastern side of the bank is very steep-to.

Normanby bank, with a least depth of 6 fathoms (11^m0), coral, over it and very steep-to, lies south-eastward of Sunday bank, the passage between the 100-fathom (182^m9) lines surrounding each bank being about 1¼ miles wide.

Sentry bank, over which there is a least depth of 7 fathoms (12^m8), is an extensive bank of sand and coral, situated about 16 miles north-north-eastward of Tanjong Unsang (*Lat. 5° 26′ N., Long. 119° 12′ E.*).

Talantam bank, with a least charted depth of 5 fathoms (9^m1) over it, lies 9 miles eastward of the shoalest part of Sentry bank. A depth of 4¼ fathoms (7^m8) was reported to have been obtained by the s.s. *Offenbach* in 1907; as the bottom was clearly visible it is probable that there is even less depth over the shoal. A shoal, with a depth of 4 fathoms (7^m3) over it, was reported, in 1948, to lie about 3¼ miles south-westward of the 5-fathom (9^m1) patch on Talantam bank.

With the wind against the tidal stream there are heavy overfalls and tide ripplings round this bank, sometimes extending as far as the eye can see, and much resembling broken water.

Gem reef, with a least depth of 3 feet (0^m9), coral and sand, over it, near its centre, lies 7½ miles northward of Tambisan island.

René shoal, with a least depth of 3 fathoms (5^m5), coral and sand, over it, lies about 3 miles north-north-eastward of the eastern extremity of Tambisan island.

Tidal streams.—Current.—The tidal streams were observed to set southward and northward.

During the two days in August 1892 that the *Egeria* was at anchor on Sentry bank, the current was observed to set almost constantly between 047° and 137°, varying from a quarter of a knot to 1½ knots, but the tidal streams appeared to exercise a decided influence on the strength and direction of the current.

Coast.—Light.—Between Tambisan island and the entrance to Dent haven, about 12 miles south-south-eastward, the coast is low,

Chart 1868.

swampy, covered with dense jungle, and fringed by a narrow strip of coral which is steep-to.

A light is exhibited, at an elevation of 85 feet ($25^{m}9$), from a white iron framework tower, 75 feet ($22^{m}9$) in height, on Tanjong Trang, situated about 1¼ miles south-eastward of Tanjong Unsang.

Chart 1781, plan of Dent haven.

Dent haven.—Dent haven, entered between Reef point, situated 9 miles southward of Tanjong Trang, and Mangrove point, about 2 miles farther southward, affords good anchorage during the South-west monsoon, but a slight swell sometimes sets into the bay. The southern part of the bay close inshore is foul. Three brackish rivulets flow into the bay; the two northern dry across their entrances; in the southern rivulet boats can find good shelter inside the spit, in deep water, the entrance being through a narrow channel in the reef. The whole coastline is the barrier of a great swamp.

There is no village in Dent haven. Fish may be obtained with the seine near the beach southward of the southern rivulet. Bathing in the rivulets is dangerous on account of crocodiles.

Reef point is fringed by a reef which extends about three-quarters of a cable off it. A sandbank, awash, lies with its southern end about 3 cables north-eastward of the point. Northward of the point, within the 5-fathom ($9^{m}1$) line, the depths are very irregular.

Mangrove point is the northern extremity of an island covered with mangroves lying close offshore, and fringed on its northern and eastern sides by a narrow reef.

Off-lying dangers.—Hull rock (*Lat. 5° 17′ N., Long. 119° 17′ E.*), over which there is a least depth of 4 feet ($1^{m}2$), and which sometimes breaks, lies on a bank of hard sand, about 1½ miles east-north-eastward of Reef point.

Between the northern tongue of the bank on which Hull rock lies and the coastal bank there is a channel half a mile wide, with depths of from 6 to 7 fathoms ($11^{m}0$ to $12^{m}8$), but it is encumbered by a sandy patch with a least depth of 3 fathoms ($5^{m}5$) over it, and is not recommended.

A 4¼-fathom ($7^{m}8$) patch lies one mile east-north-eastward of Reef point.

Hardy patch, a coral shoal, with a depth of 3 fathoms ($5^{m}5$) over it, lies about 2¼ miles east-north-eastward of Mangrove point; it is marked by strong tide-rips, and the water over it is usually discoloured. This shoal is a danger to vessels passing Dent haven at night or in thick weather, but it may be avoided by keeping outside the 20-fathom ($36^{m}6$) line which passes about 1¼ miles eastward of it.

There are several patches, with depths of from 2¾ to 3 fathoms ($5^{m}0$ to $5^{m}5$) over them, lying within 8 cables northward of Mangrove point.

Anchorage.—Directions.—Anchorage may be obtained, in depths of from 3½ to 4 fathoms ($6^{m}4$ to $7^{m}3$), sand and mud, anywhere in Dent haven clear of the shoal patches mentioned above, but there are more regular depths in the northern part.

Approaching from northward the extremity of the land southward of Mangrove point should not be brought to bear less than 217° until the southern end of the long sandy beach in the bay northward of Alfred point bears 255°, when the latter may be steered for, anchoring as convenient.

Charts 928, 2576, 2660b, 1263.

Chart 1868.

Tidal streams.—Between Dent haven and Tanjong Labian, 7 miles south-westward of Mangrove point, the tidal streams set strongly southward and northward at a rate of from 1½ to 3 knots at times, but they are extremely variable in strength and direction in this vicinity. Occasionally the stream was observed, in 1892, to run strongly in one direction for one or two days, and then in the opposite direction for a day, for no reason that could be assigned; at other times the streams changed approximately at high and low water by the shore.

Farther westward on the northern shore of Darvel bay the tidal streams are weaker, and have a rate of about one knot at springs, setting westward and eastward.

In Dent haven the tidal stream begins to set northward 3 hours before high water, and southward 3 hours before low water; it appears probable that this is an eddy.

Coast.—In the vicinity of Dent haven the coast is swampy and fringed with mangroves, but as it curves southward and westward the swamp gives way to a hard sandy beach closely backed by jungle, through which, however, it is not difficult to force one's way, and there are along this coast occasional comparatively open spaces where deer may frequently be found. There are a few small streams on this coast, but no rivers.

Between Gem reef and Sibutu passage frequent and sharply defined tide-rips occur, which have the appearance of shoal water.

Chart 928.

SIBUTU PASSAGE.—Sibutu passage, separating the islands fronting Darvel bay from the Tawitawi group of the Sulu archipelago, is a safe and deep channel 18 miles wide between Sibutu island on the west and Simunul island on the east, the shore on either side being steep-to. The only prominent landmarks are Bongao peak (page 196) on the eastern side and Sibutu hill on the western side.

Western side of Sibutu passage.—Light.—Sibutu island is low, densely wooded and flat except Sibutu hill (*Lat. 4° 50′ N., Long. 119° 30′ E.*), 448 feet ($136^{m}5$) high to the tops of the trees and conical shaped, on the eastern side of the island, about 6 miles from the northern extremity. The coast consists mostly of low cliff of upraised coral broken in places by a sandy beach. A narrow reef fringes the coast on both sides and northward, but from the southern extremity the reef extends southward for 4¼ miles, enclosing a shallow lagoon which has no entrance.

The reef dries in patches, and near the southern end there is a sandbank with a wooded islet on it, the trees of which are 120 feet ($36^{m}6$) high; there are also two other small islets on the sandbank. The fringing reef is steep-to, and the depths immediately adjacent to the reef are in general too great for anchoring. There is, however, a bank, with a depth of 15 fathoms ($27^{m}4$) over it at the northern end, and a smaller area, with a depth of 20 fathoms ($36^{m}6$), at the southern end.

A light is exhibited, at an elevation of 94 feet ($28^{m}7$), from a black cylindrical iron framework tower, on Saluag islet, the southernmost of the islets situated on the reef extending from the southern point of Sibutu island. Anchorage may be obtained by vessels with local

Charts 2576, 943, 2660b, 1263.

Chart 928.

knowledge off the southern end, with Saluag lighthouse bearing 349°, distant 1½ miles. Strong tidal streams set round the ends of Sibutu, and care should be taken that the anchor does not drag after the turn of the stream.

For the islands and channels westward of Sibutu island, *see* page 148.

Eastern side of Sibutu passage.—Sanga Sanga island, at the northern end of the eastern side of Sibutu passage, is about 300 feet (91m4) high, and densely wooded. It is steep-to on the western side, where it is fringed by a narrow coral reef; its coast consists of a high coral bank with numerous small sandy beaches; the island is cultivated in places at its southern end.

Chart 2576, plan of Port Bongao.

Bongao island, separated from the southern side of Sanga Sanga island by Bongao channel, is 1,030 feet (313m9) high in the southern part; this high land, consisting of several peaks, is prominent from all directions. The northern part of the island is low, and the coastline consists of mangrove; a coral reef extends from the western and southern sides.

Bongao channel is encumbered with shoals and is very seldom used.

For the description of Port Bongao and islets and dangers south-eastward of Bongao island, *see* page 195.

Chart 928.

Simunul island, 5½ miles south-south-eastward of Bongao island, is low, flat, and cultivated; it is fringed by a coral reef which is steep-to. Inside the reef, on the north-eastern side of the island there is a shallow lagoon, the entrance to which is difficult to identify on account of the trees growing in the water just inside. There is no anchorage off the island, the depths being very great close up to the reef.

Manuk Manka island, 1¾ miles southward of Simunul island, is 30 feet (9m1) high, and cultivated; it is fringed by a reef, which, on the southern and eastern sides, is marked by coral rocks which dry about 4 feet (1m2).

The edges of the reefs fringing both islands can easily be seen. The channels between the islands and between Simunul island (*Lat. 4° 53′ N., Long. 119° 49′ E.*) and the reefs northward and eastward are deep and clear of dangers.

Charts 1868, 928.

Directions.—The following remarks are extracted from a report by the Master of the s.s. *Phorus*, in December 1921 :—" When approaching from the northward it is advisable to make Pearl bank (page 189) by day; in any case, the navigation of Sibutu passage is quite safe by night after passing Pearl bank, as Sibutu hill and Bongao island are conspicuous even on the darkest nights."

" When making Sibutu passage from the southward, the best time to approach is at dawn, as rain is less frequent then than at any other time of the day."

Tidal streams.—When navigating Sibutu passage, great attention should be paid to the tidal streams, which run at a rate of from 2 to 5 knots, and at times the south-going stream attains a rate of 6 knots, presumably due to the permanent Borneo coastal current which flows in a south-easterly direction into the passage. The streams set north-north-west and south. Off the north-western coasts of Sanga Sanga

Charts 1868, 928.

and Bongao islands the north-north-west-going stream is deviated to an easterly or south-easterly direction on account of the Borneo coastal current. As a general rule, slack water occurs within one or two hours of high or low water, but the south-going stream has been known to continue setting through the passage for several days at a time. A constant southerly set was experienced in the passage from the 15th to 19th September, 1914, the average direction being about 160° and the rate about 1$\frac{3}{4}$ knots.

During the South-west monsoon the streams set northward and southward, and turn several hours after high and low water by the shore.

During the survey, in 1872, H.M.S. *Nassau* reported that the tidal streams in the main channel were very steady in direction, setting 317° and 182°, but there was uncertainty as to duration; they occasionally set as much as 10 hours at a time, probably influenced by the winds and also by changes in the moon's declination, as with the tides on the south coast of Mindanao.

In the channel westward of Sibutu island H.M.S. *Egeria*, in 1892, observed the flood stream to set southward and the ebb northward at a rate of from 3 to 4 knots, and the streams to turn at high and low water by the shore.

Charts 928, 2576.

ISLANDS AND DANGERS WESTWARD OF SIBUTU ISLAND.—An extensive reef lies westward of and parallel with Sibutu island, being separated by a deep channel from 1$\frac{1}{2}$ to 2 miles wide. On the reef is a chain of low, flat-topped wooded islands, from 55 to 190 feet ($16^{m}8$ to $57^{m}9$) high. At the northern end is Omapoy (Omapui) (*Lat. 4° 53′ N., Long. 119° 24′ E.*), with Sipangkot (Sipankot) about half a mile southward of it. Tumindao, the largest of these islands, lies about the middle of the eastern side of the reef, and farther southward are Sitankai, 150 feet ($45^{m}7$) high, and several other islets. Sitankai is of some importance, as most of the trade between Borneo and the Bongao district of the Tawitawi group of the Sulu islands centres there. There is a landing place on the edge of the reef eastward of Sitankai, which may be reached by a launch at any state of the tide. There are many small villages on these islands.

There is a concrete pier, with a depth of 18 feet ($5^{m}5$) alongside, at Sitankai village.

On the north-western side of the reef is the entrance to a large lagoon which affords access to the village on the western side of Tumindao. It has a large area with uniform depths of from 9 to 10 fathoms ($16^{m}5$ to $18^{m}3$), in the northern part, which affords excellent anchorage. Vessels with local knowledge should approach the entrance with a large bushy mango tree of a dark green colour on the western side of Sibutu island in line with the saddle at the summit of Sibutu hill, and thence navigate the entrance by eye if the light is favourable.

Near the southern end of the extensive reef are two narrow channels leading into another lagoon, in which there are depths of from 7 to 12 fathoms ($12^{m}8$ to $21^{m}9$), and there is a narrow opening at the eastern end. This lagoon consists of two basins, connected by a deep channel. There is a least depth of 6 fathoms ($11^{m}0$) in the north-western channel which is a quarter of a mile wide; in the opening at the eastern end,

Charts 2660b, 1263.

Charts 928, 2576.

which is about one cable wide, there is a least depth of 4 fathoms ($7^{m}3$), sand; the south-western channel is impassable.

Vessels with local knowledge may obtain anchorage in the eastern basin; it is the only safe anchorage in the vicinity of Sibutu.

The edge of the reef is very steep-to, except off the north-western side near the entrance to the northern lagoon, where the 10-fathom ($18^{m}3$) line is about three-quarters of a mile distant.

Andulinang islet, about 10½ miles westward of the northern point of Tumindao, is wooded and has a hill, 89 feet ($27^{m}1$) high to the tops of the trees, which is the most noticeable feature in the vicinity. A rock, about 30 feet ($9^{m}1$) high, lies close northward of the islet. The islet lies close to the western edge and about 3 miles from the southern end of a reef, which dries in patches, and on the northern end of which are two sand cays which dry 3 feet ($0^{m}9$).

Purdie patches are a series of small detached sand and coral banks, with depths of from 8 to 10 fathoms ($14^{m}6$ to $18^{m}3$) over them, lying off the northern end of the above-mentioned reef, and from 3½ to 5½ miles northward of Andulinang islet. Anchorage may be obtained on these patches.

The maximum rate of the tidal stream experienced over the Purdie patches, was 2 knots.

Chambers knoll, a small detached coral knoll, with a depth of 9 fathoms ($16^{m}5$) over it, lies about 3½ miles north-westward of Andulinang islet.

Maranas islet, planted with coconut trees about 50 feet ($15^{m}2$) high, lies in the middle of a detached reef about 2¾ miles southward of Andulinang islet. The reef, which extends from a quarter to half a mile from Maranas islet, is steep-to, and there is a clear channel half a mile wide between it and the southern end of the reef on which Andulinang islet (*Lat. 4° 46′ N., Long. 119° 15′ E.*) lies.

Meridian reef is separated from the southern end of the reef on which Andulinang lies by a channel half a mile wide, with depths of from 7 to 8 fathoms ($12^{m}8$ to $14^{m}6$), and extends 12 miles southward. A sand cay, which dries 4 feet ($1^{m}2$), lies near the southern end of the reef. Off the western side of the reef, there are depths of from 8 to 15 fathoms ($14^{m}6$ to $27^{m}4$) for a distance of 1½ miles, and this vicinity affords an excellent anchorage. The eastern side of the reef is steep-to.

Chart 2576.

Middle reef lies about one mile southward of Meridian reef with a sand cay near its northern extremity. In the channel between the two reefs there is a depth of 7 fathoms ($12^{m}8$) in the middle, but it is too narrow for vessels to use it with safety, as shoal water extends from either side, and the tidal streams set strongly through it.

Frances reef, close southward of Middle reef, is the southernmost of the chain of reefs extending southward from Andulinang islet. The eastern side of the reef is steep-to, but the western side, on which there is a long sand cay which dries, shoals gradually. The channel between Middle and Frances reefs is narrow and foul.

Chart 928.

Blake reef lies westward of Maranas islet, the channel between them being about 6½ cables wide.

Bulubulu islet, 3¾ miles south-south-westward of Maranas islet, is planted with coconut trees, the tops of which are about 55 feet ($16^{m}8$)

Charts 2660b, 1263.

Chart 928.

high. The islet is fringed by a reef which extends from one to 2 cables from it. A coral patch, with a depth of 7 fathoms ($12^{m}8$) over it, lies three-quarters of a mile north-westward of it.

Anchorage may be obtained, in depths of from 13 to 17 fathoms ($23^{m}8$ to $31^{m}1$), sand, eastward of Bulubulu islet.

Payne rock, awash, lies on about the middle of a narrow shoal of sand and coral, with depths of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$) over it, situated 6¾ miles southward of Bulubulu islet.

Chart 2576.

James patch is a small coral patch, with a depth of 7 fathoms ($12^{m}8$) over it, situated 3¼ miles southward of Payne rock.

Chart 928.

Siluag islet, 5¼ miles westward of Maranas islet, is flat-topped, and planted with coconut trees, about 70 feet ($21^{m}3$) high. A reef extends from a quarter of a cable to 1½ cables from the islet. A 7½-fathom ($13^{m}7$) patch lies 1½ miles north-north-eastward of Siluag islet.

Riddells reef, the northern end of which lies 4½ miles southward of Siluag islet, has two sand cays, which dry, at its southern end. Two coral shoals, with depths of 5 and 3½ fathoms ($9^{m}1$ and $6^{m}4$) over them, lie about 2 and 3¼ miles, respectively, southward of Siluag islet.

Charts 1680, 928.

Bajapa reef, the northern extremity of which lies about 2¼ miles westward of Siluag islet, dries in patches and encloses a lagoon in the centre, the entrance to which is on the south-western side. The reef is steep-to on all sides, except at the northern end, where a spit extends off for a short distance.

A shoal, over which there is a depth of 6¼ fathoms ($11^{m}4$), coral and sand, lies 5 miles southward of the southern extremity of Bajapa reef.

Alice reef, 1¾ miles north-westward of Bajapa reef, is steep-to except off its north-eastern point, from which a bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends over half a mile. On the western side, about 2¾ miles from the southern extremity of the reef, is the entrance to a lagoon.

Chart 1680.

Panguan islet, 75 feet ($22^{m}9$) high, and wooded, lies on the southern end of a reef, which is steep-to, situated one mile westward of the southern end of Alice reef. A spit, with a depth of 5 fathoms ($9^{m}1$) over it, extends 2 cables northward and another the same distance south-westward from the reef on which Panguan islet lies.

Charts 928, 2576.

Channels.—The channel on the western side of Meridian and Frances reefs, and eastward of Blake reef, Payne rock, and James patch, is convenient as affording anchorage in every part; the only narrow part of it is when passing Maranas islet (*Lat. 4° 44′ N., Long. 119° 14′ E.*) which may be passed on either side, and no special directions are necessary.

Chart 2576.

The channel, westward of the line joining Blake reef and Payne rock and eastward of Riddells reef, is 2¾ miles wide at its narrowest part between Blake reef and Siluag islet; it is perhaps the most convenient to use generally, being more direct than those farther eastward, whilst the tidal streams do not attain the same strength as in the channels westward.

Charts 2660b, 1263.

Chart 2576.

The channel westward of Siluag islet and Riddells reef, and eastward of Bajapa reef has a least width of 1½ miles. The tidal streams run at a considerable rate in this channel, and they should be well considered before using this route.

These channels are all too deep for anchorage.

Along the southern edge of the bank on which these reefs lie, a rim of lesser depths runs close within and parallel to the 100-fathom ($182^{\mathrm{m}}9$) line, but 17 fathoms ($31^{\mathrm{m}}1$) is the least depth found on this rim; the edge falls steeply to great depths and is clearly marked by tide-rips and overfalls, which give the appearance at times of shoal water.

Tidal streams.—In the channel eastward of Meridian reef the tidal streams run at a rate of from 2 to 4 knots.

On the edge of the bank south-westward of Frances reef the south-going stream runs frequently at a rate of as much as 3 knots, and sets south-eastward over the edge of the bank.

Chart 1680.

DARVEL BAY.—Darvel bay is situated on the southern side of the peninsula of which Tanjong Unsang is the north-eastern extremity. The northern shore of the bay westward of Tanjong Labian, the northern entrance point, is clear of off-lying dangers, except Howard shoal, about 35 miles west-south-westward of Tanjong Labian, and a 4½-fathom ($8^{\mathrm{m}}2$) patch, 6¾ miles farther westward, but there are numerous islands and coral reefs in the western and southern parts of the bay. Numerous rivers flow into the bay, but very few are navigable for boats beyond a short distance from their mouths.

The hills on the northern side are densely wooded, and for the most part low and undulating, of uniform outline, presenting few definite features, and culminate in the Bagahak range midway along the coast. The southern side is also everywhere thickly wooded, with mountainous ranges some distance inland, but these are generally more remarkable in shape and more easily identified than those on the northern shore. Most prominent among them may be mentioned Mounts Madai and Sinalong (chart 2576), and on a clear day Mount Silam, at the head of the bay, overtops all others in the vicinity.

Of the islands in the bay, Timbu Mata island, separated from the mainland by a narrow channel, is much the largest and Mount Tanna Ballu, its sharp summit, is an excellent landmark. Pulau Gaia, just within the entrance to the bay, stands well out from the land, and is of so remarkable a shape from most points of view that it is quite unmistakable. *See* views A and B, on chart 1680, and views facing page 160.

Charts 1680, 1681.

The shores of the bay are sparsely inhabited. There are a few villages on the northern shore, but none on the southern shore. The only inhabited islands are Tatagan (*Lat. 4° 36′ N., Long. 118° 43′ E.*), close southward of the south-western extremity of Pulau Gaia; Larapan, 6¾ miles west-south-westward of Tatagan; Bum-Bum island, which forms the point of separation between Darvel and Sibuko bays; and Omadal, about 1¾ miles southward of the eastern point of Bum-Bum island. These natives are descendants of the pirates that formerly infested these waters, and speak the Malay and Sulu languages.

Charts 2660b, 1263.

Charts 1680, 1681.

The British government have settlements at Lahad Datu, on the northern shore, and at Semporna (page 174). The District officer resides at Lahad Datu, a detachment of constabulary is stationed there.

Chart 1680.

Tidal streams.—The general set of the in-going stream is southward and westward, and of the out-going stream northward and eastward, these directions being modified by the trend of the land and reefs in particular localities.

Along the northern shore of Darvel bay the in-going stream sets westward and the out-going stream eastward, at a rate of about one knot at springs. Along the southern shore of the bay the in-going stream sets westward, and the out-going stream eastward and northeastward, the direction being modified by the land; the rate is not very great.

The tidal streams appear to turn approximately at the times of high and low water by the shore.

Chart 1868.

Aspect.—Between Tanjong Labian and Tungku point, 23 miles west-south-westward, the land rises gradually from the low sandy coast to a wooded ridge, from 400 to 500 feet ($121^{m}9$ to $152^{m}4$) high, about 1½ miles inland. There is nothing remarkable in this ridge, and a uniformly flat densely wooded country forms the eastern portion of the peninsula of which Tanjong Unsang is the north-eastern extremity. About 3 miles westward of the head of Dent haven there appears to be a range of wooded hills, from 400 to 500 feet ($121^{m}9$ to $152^{m}4$) high, which show on the sky line, but the only hill that can be identified is a wooded summit, 500 feet ($152^{m}4$) high, 3½ miles west-south-westward of Mangrove point.

Chart 1680.

Mount Bagahak (*Lat. 5° 03′ N., Long. 118° 46′ E.*), 2,740 feet ($835^{m}1$) high, situated 7 miles west-north-westward of Tungku point, is the summit of the mountainous range on the northern shore of Darvel bay. It falls steeply on its northern and eastern sides, and is prominent as a distinct peak from those directions, but is frequently obscured by clouds; it slopes very gradually on its southern and western sides, and thence becomes as a smooth-topped range with no prominent features on it.

Chart 1868.

Falling northward to quite a low watershed, the ridge rises again to a rounded apex 1,740 feet ($530^{m}4$) high, at 5½ miles north-north-eastward of Mount Bagahak, and continuing for 6 miles north-eastward, it then gradually diminishes in altitude, terminating in End hill, 1,400 feet ($426^{m}7$) high, from which it slopes gradually down, and loses itself finally in the flat wooded country behind Tanjong Labian.

Charts 1680, 2576.

Westward of the Bagahak range there is a considerable area of apparently flat country drained by the Silibukan river. About 8½ miles northward of the southern extremity of Darvel peninsula a ridge running north and south rises to a summit, 995 feet ($303^{m}3$) high, which may be readily distinguished. Westward of this ridge and separated from it by a valley, the land gradually rises from the coast to a perfectly flat-topped, densely wooded ridge, about 600 feet

Charts 2660b, 1263.

Charts 1680, 2576.

(182^{m}9) high, and lying 3 miles inland; the top of this ridge forms the skyline from seaward.

Charts 1680, 1868.

NORTHERN SIDE OF DARVEL BAY.—Tanjong Labian is low and difficult to identify; 4 miles south-westward is a rounded point, noticeable for the high casuarina trees behind it, and 7½ miles farther westward is another rounded point also noticeable for its high trees, which border the coast between the two points; close westward of the western point is the entrance to Teloh Sibet, a small river, the mouth of which dries and is marked by nipa palms. About one mile westward of the western entrance point of Teloh Sibet is a red cliff, 80 feet (24^{m}4) high.

About 10 miles farther west-south-westward is Tungku point (*Lat. 5° 00′ N., Long. 118° 52′ E.*), and midway between is the village of Tolibas and another scattered village. Tolibas village stands at the mouth of a small stream, the entrance to which is marked by stakes.

A mud flat, which dries, extends nearly half a mile southward from Tungku point, and a bank, with depths of less than 3 fathoms (5^{m}5) over it, extends a quarter of a mile farther, falling steeply into a depth of 14 fathoms (25^{m}6). The edge of the bank does not always show clearly on account of the general discoloration of the water from the Tungku river; as the marks for fixing the position are distant, vessels should keep outside the 20-fathom (36^{m}6) line when passing Tungku point.

Chart 1680.

Westward of Tungku point, which is low, the land rises to the Bagahak range, the spurs from which slope steeply to the coast. Northward of the point there is a well-defined ridge of undulating hills, from 400 to 575 feet (121^{m}9 to 175^{m}3) high, lying from one to 2 miles inland. Tungku river, which rises 12 miles northward of Tungku point, flows through a gap in these hills and enters the bay close westward of the point. There is a depth of only from one to 2 feet (0^{m}3 to 0^{m}6) on the bar in the entrance. A village stands on the eastern bank of the river about three-quarters of a mile within the entrance.

Charts 1680, 1868.

From the regularity of the soundings the depths serve as a reliable guide in navigating this coast at night, or in thick weather, but care should be taken not to get into a depth of less than 10 fathoms (18^{m}3) westward of Tanjong Labian, nor less than 20 fathoms (36^{m}6) north-eastward of it.

Chart 1680.

Bagahak point (*Lat. 4° 56′ N., Long. 118° 39′ E.*), 13½ miles westward of Tungku point, is a low mangrove point, but a spur of the Bagahak range, 520 feet (158^{m}5) high, runs down in a southerly direction to within 1¼ miles eastward of it. This spur is a prominent feature when seen from eastward or westward, and a summit on it, 950 feet (289^{m}6) high, about one mile inland, forms a landmark easily identified from those directions, but not from southward, on account of the higher land behind it. *See* view B, on chart 1680.

For a distance of 2 miles eastward and 4 miles westward of Bagahak

Charts 2576, 2660b, 1263.

Chart 1680.

point the coast is fringed by coral reefs which extend three-quarters of a mile offshore, in which there are three narrow channels leading to the shore, with depths of from 5 to 10 fathoms ($9^{m}1$ to $18^{m}3$); the edges of these reefs are steep-to.

Kennedy bay, entered about 5½ miles westward of Bagahak point, has not been thoroughly examined, but it appears to afford good anchorage, in a depth of 10 fathoms ($18^{m}3$), mud, about 6½ cables from the head. A reef extends about half a mile south-south-westward from the north-eastern entrance point of the bay, and a flat, part of which dries 3 feet ($0^{m}9$), extends with depths of less than 5 fathoms ($9^{m}1$) over it, for 1¾ miles south-eastward from the western side.

To enter Kennedy bay, a vessel should steer for the summit of the 335-foot ($102^{m}1$) summit on the north-western side of the bay, bearing 309°, which will lead half a mile south-westward of Turner patch, and to the anchorage, from which Shoal point, situated 8¼ miles westward of Bagahak point, bears 235°, with the western extremity of Tabauwan island just open south-eastward of it.

Off-lying dangers.—Howard shoal, 2½ miles south-eastward of Bagahak point, is a narrow coral shoal, with a depth of 2¼ fathoms ($4^{m}1$) over it, rising abruptly from depths of over 20 fathoms ($36^{m}6$).

In 1932, s.s. *Kinabalu* reported having obtained a depth of 4½ fathoms ($8^{m}2$), in a position about 3¼ miles east-south-eastward of Shoal point, the south-eastern extremity of Darvel peninsula; the shoal has not been examined.

Turner patch, a small coral bank, with a depth of 9 fathoms ($16^{m}5$) over it, and possibly less, lies 3¾ miles westward of Bagahak point (*Lat. 4° 56′ N., Long. 118° 39′ E.*) and 1¼ miles offshore.

Darvel peninsula.—Darvel peninsula, westward of Kennedy bay, is low and flat, fronted by mud flats, and covered by trees, from 100 to 120 feet ($30^{m}5$ to $36^{m}6$) high. Deep mangrove creeks intersect the peninsula, but none of them appears to connect with the Silibukan river farther northward.

A bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends nearly one mile southward from Shoal point.

The depth decreases very suddenly from 10 to 3 fathoms ($18^{m}3$ to $5^{m}5$) south-eastward of the point, and vessels passing should keep a good offing as the soundings give little warning. Tanjong Malandong is the south-western point of Darvel peninsula.

Segannen and Silibukan rivers converge at 1¼ miles within their common entrance on the north-western side of Darvel peninsula. This entrance is nearly half a mile wide at the mouth, and may be identified by a clump of trees, 130 feet ($39^{m}6$) high, on the north-western entrance point, somewhat higher than the dead level of the trees in the immediate neighbourhood.

A spit, with depths of less than one fathom ($1^{m}8$) over it, extends 1½ miles westward from the entrance points of these rivers. Mud flats stretch off the southern entrance point, which should therefore be avoided. The northern and western edges of the spit are very steep-to, falling down abruptly from 3 feet to 11 fathoms ($0^{m}9$ to $20^{m}1$); the soundings obtained therefore on passing it give little warning.

Segannen, the northern river, was explored by the boats of H.M.S. *Egeria*, in 1891, as far as about 3 miles up the river, where there is a landing jetty. Silibukan, the southern river, was also examined, in

Charts 2576, 2660b, 1263.

1891, as far as Telok Bukan (*Lat. 4° 59′ N., Long. 118° 31′ E.*), 4 miles above the junction of the two rivers. At the estate the river is about 60 feet (18m3) in width, with a depth of 6 feet (1m8), but the level changes with the seasons. The tide affects the level of the water in Silibukan river as far up as the tobacco estate.

Off-lying dangers.—Light.—Armstrong reef, a small coral reef, which dries 5 feet (1m5), with depths of 6 and 7 fathoms (11m0 and 12m8) around it, lies 2¼ miles west-north-westward of Tanjong Malandong.

A light is exhibited, at an elevation of 25 feet (7m6), from a white framework tower with red horizontal bands, on Armstrong reef.

The summit of Adal island (*Lat. 4° 45′ N., Long. 118° 31′ E.*) in line with the south-western peak of Mount Sidongal, bearing 153°, leads 6 cables south-westward of Armstrong reef, and half a mile south-westward of the edge of the shoal spit off the entrance to Segannen river. Both Adal island and the south-western peak of Mount Sidongal show as sharp, well-defined summits.

Approaches to Lahad Datu.—Dangers.—Beacons.—Between the north-western entrance point of Segannen and Silibukan rivers, described above, and the settlement of Lahad Datu, about 8 miles west-north-westward, there are detached reefs lying within one mile of the coast, thence for 3 miles southward of Lahad Datu the coast is bordered by mangroves.

Sakar island, separated from the northern shore of Darvel bay by a narrow channel, lies southward of Lahad Datu ; it is densely wooded, and rises near the centre of the southern side to a prominent knob, 735 feet (224m0) high, visible over Darvel peninsula, but it is not distinguishable as an island. The northern coast of the island is much indented, narrowing the island in two places to a width of half a mile, and there are some islets lying close off that coast.

The north-eastern extremity of Sakar island slopes steeply down to a low point from which a reef extends eastward for three-quarters of a mile. Three pile beacons, each surmounted by a white cylinder, mark the eastern edge of the reef, but they are liable to be washed away ; they are marked from southward " No. 2, 4 and 6," respectively. The edge of the reef is not always easily distinguished, and it should be rounded with caution.

The summit of Adal island in line with the south-western peak of Mount Sidongal, bearing 153°, just clears the edge of the reef off the north-eastern extremity of Sakar island, and Adal island must be brought to the south-westward of this peak before rounding the reef.

Crook reef lies off the middle of the southern side of Sakar island, one mile southward of the prominent knob. Some small islets lie within half a mile of the south-western side of Sakar island ; the south-westernmost of these has a sharp nipple, 125 feet (38m1) high, at its south-eastern end.

Halloran reef (*Lat. 5° 00′ N., Long. 118° 22′ E.*), lying 4 cables off the centre of the northern coast of Sakar island, and 1½ miles west-north-westward of the north-eastern point of the island, is a small coral reef, which dries 5 feet (1m5) ; a spit extends for a short distance off its north-eastern side, and is marked by a pile beacon, No. 8, surmounted by a white cylinder.

The north-eastern extremity of Sakar island in line with the light-

Chart 1680.

structure on Armstrong reef, bearing 134°, leads about half a mile north-eastward of Halloran reef.

Voorwyk reefs are a chain of four small reefs extending from half a mile to 1½ miles south-eastward from the head of the pier at Lahad Datu; they dry 2 feet (0^m6), and are fairly steep-to, with a depth of 7 fathoms (12^m8) close-to, but a spit extends for a short distance southward of the south-easternmost reef.

The two northern reefs are called Gosungan, and are marked at the north-eastern extremity by a tripod beacon, No. 18, surmounted by a red cylinder. The western extremity is marked by a tripod beacon, No. 9, surmounted by a cone.

The centre and largest reef, named Voorwyk, is marked at its eastern extremity by a tripod beacon, No. 16, surmounted by a red cylinder; at its western extremity by a beacon, No. 7, surmounted by a black cone, and at its southern extremity by a beacon, No. 5, surmounted by a black cone.

The southern reef, named Tinggeri, is marked at its eastern extremity by a tripod beacon, No. 14, surmounted by a red cylinder, and at its western extremity by a tripod beacon, No. 3, surmounted by a cone.

There are deep channels between Tinggeri and Voorwyk, and between Voorwyk and Gosungan.

A coral patch, named Bershesherk, with a depth of 4 feet (1^m2) over it and 6 fathoms (11^m0) close round it, lies midway between Gosungan and the shore northward of it. It is marked on its southern side by a beacon, No. 11, surmounted by a black cone.

A beacon, No. 13, surmounted by a black cone, marks the edge of the coastal reef about 6½ cables eastward of the pier-head at Lahad Datu.

Gray reef is a small coral reef 4 cables southward of the pier-head, with a depth of from 3 to 3½ fathoms (5^m5 to 6^m4) close to its eastern edge. Another small reef lies about 3½ cables southward of it. The eastern edges of these reefs are marked by white beacons, each surmounted by a red cylinder, the one indicating Gray reef being No. 12 and the other No. 10.

Charts 1593, 1680.

The channel westward of Sakar island is less than one cable wide in places, with depths of from 2 to 4 feet (0^m6 to 1^m2). Steam launches can use this channel at high water, but a rock, which dries nearly 3 feet (0^m9), lies on the eastern side, three-quarters of a mile within the southern entrance, and about half a cable westward of the south-western point of an islet at a turning point in the channel.

Chart 1680.

Anchorage.—Directions.—Anchorage may be obtained between Gray reef and the northernmost Voorwyk reef, in a depth of 5 fathoms (9^m1), mud, with the pier-head bearing 327°, and a conical hill, 580 feet (176^m8) high, situated 3 miles west-south-westward of the pier, bearing 255°.

From a position not less than 1½ miles southward of Darvel peninsula a vessel should steer westward until the summit of Adal island (*Lat. 4° 45′ N., Long. 118° 31′ E.*) is in line with the south-western peak of Mount Sidongal, bearing 153°, when she should keep that alignment on astern until the summit of Sakar island is in line with Mount Silam, bearing about 269°, when she should alter course northward and bring the north-eastern extremity of Adal island in line astern with the

Charts 2576, 2660b, 1263.

Chart 1680.

south-western peak of Mount Sidongal, bearing about 154°, which will lead north-eastward of the reef extending from the eastern end of Sakar island.

Having passed this reef, she should alter course north-westward, and when the 580-foot ($176^{m}8$) conical hill bears 272° she should steer for it on that bearing until the north-eastern extremity of Sakar island is in line with Tanjong Malandong, bearing about 124°, when she should steer 295° until the pier-head at Lahad Datu bears 327°, when she should steer for it on that bearing, which will lead to the anchorage between Voorwyk and Gray reefs.

The anchorage may be approached by passing northward of Nos. 14, 16 and 18 beacons, and southward of Nos. 11 and 13. Large vessels are recommended to use the southern channel except when leaving the pier. The radio mast about 6 cables north-westward of the head of the pier is prominent when approaching.

Tidal streams.—There is intermittently a very slight east-going stream, but it is usually slack water.

Lahad Datu.—Lahad Datu is a small settlement forming the headquarters of the District officer, and has an extensive area under coconuts and rubber.

The zinc-roofed houses are visible on approaching from eastward as soon as they open out clear of Sakar island.

A pier, 966 feet ($294^{m}4$) long, extends south-eastward from the south-western corner of the settlement into a depth of 3 fathoms ($5^{m}5$); it is 90 feet ($27^{m}4$) wide at its head, and is used by local steamers. The Government wharf is 78 feet ($23^{m}8$) long, and has a depth of 18 feet ($5^{m}5$) alongside.

Harbour facilities.—Vegetables and bread may be obtained. Water may be obtained from the settlement, but it is not laid on to the pier.

Communication.—There is steamer communication with Sandakan and other ports in the State of North Borneo.

Chart 1681.

SOUTHERN SIDE OF DARVEL BAY.—Aspect.—Mount Sinalong, 2,060 feet ($627^{m}9$) high, and conical, lies about 19 miles westward of Panto Panto point, the eastern extremity of Bum-Bum island and the southern entrance point of Darvel bay. It is one of the most prominent mountains on the southern side of Sigalong trusan (page 161), and falling steeply to the plain below on all sides, is easily identified. *See* view A on chart 1680. For description of the peaks on Pulau Gaia and Timbu Mata island, *see* pages 160 and 162, respectively.

Chart 1680.

Other prominent marks are Mount Hewett (*Lat. 4° 34′ N., Long. 118° 17′ E.*), 1,355 feet ($413^{m}0$) high, about 11 miles north-westward of Mount Sinalong; Mount Cook, 705 feet ($214^{m}9$) high, 4¼ miles northward of Mount Hewett; Mount Wyatt, 410 feet ($125^{m}0$) high, 4¼ miles north-westward of Mount Cook and close to the coast; and Mount Mostyn, 1,625 feet ($495^{m}3$) high, 10½ miles north-westward of Mount Hewett.

Mount Madai, 3½ miles north-north-westward of Mount Mostyn and 4¼ miles from the coast, is 1,560 feet ($475^{m}5$) high, and the most

Charts 2576, 2660b, 1263.

Chart 1680.

remarkable mountain in the vicinity of Darvel bay. It is of limestone with bare cliffs, which show white in places, but on the summit there are some low trees, and the slopes are densely wooded. From eastward the mountain shows as a perfect cone; from northward it appears as a sharp peak standing on shoulders of nearly equal elevation.

Mount Skertchley is a broad flat-topped mountain, 1,530 feet (466^{m}3) high, lying 5½ miles north-westward of Mount Madai.

Charts 1680, 2576.

Mount Beeston, situated 10½ miles north-north-westward of Mount Skertchley, is a wooded peak 2,830 feet (862^{m}6) high, sending a long spur in an east-south-easterly direction for 9½ miles down to the coast on the northern side of Lamak bay. About half-way along this spur there are the Stewart peaks, nearly three-quarters of a mile apart, the western being 1,610 feet (490^{m}7), and the eastern 1,510 feet (460^{m}2) high. From these peaks two ridges are thrown off; one trending for a long distance west-south-westward, and the other curving round southward, forms an amphitheatre in which Divatu river takes its rise.

Charts 1681, 1680.

Alice channel.—Alice channel, the southern entrance to Darvel bay, is the deep passage between Bajapa reef, Alice reef, and Panguan islet (*see* page 150) on the north-east and Mataking islets on the south-west. It is over 6 miles wide at the narrowest part between the southern extremity of Bajapa reef and the reef on which the Mataking islets lie.

Chart 1681.

Boheian island, about 18 miles westward of Frances reef (page 149), lies near the southern end of an extensive reef on the western side of the entrance to Alice channel. The reef is steep-to, with depths of 40 and 50 fathoms (73^{m}2 and 91^{m}4) within a distance of one cable. The island is low and wooded, the tops of the trees being about 120 feet (36^{m}6) high.

Charts 1681, 1680.

Near the northern end of the reef there is a small wooded islet, named Timba Timba, 33 feet (10^{m}1) high, with a sandbank, which dries 3 feet (0^{m}9), connected to its southern side.

Chart 1680.

Pulau Kapale, 90 feet (27^{m}4) high, and wooded, lies on a reef, the southern extremity of which is situated 6 cables northward of the reef extending northward from Timba Timba islet, to which it is connected by a shoal spit. A sand spit, which dries 3 feet (0^{m}9), and at the extremity of which there are a few bushes, extends about 3 cables northward of Pulau Kapale.

Pulau Mataking (*Lat. 4° 35′ N., Long. 118° 58′ E.*) and Mataking kechil lie on the western side of a reef about 1½ miles eastward of Pulau Kapale, from which they are separated by a deep channel; the reef is steep-to on all sides, except on the west between the islets, where a bank extends off a quarter of a mile. Pulau Mataking is 130 feet (39^{m}6) high, and wooded; Mataking kechil, 45 feet (13^{m}7) high, lies about half a mile northward of Pulau Mataking, and is connected to it by a narrow ridge of sand, which dries 3 feet (0^{m}9).

Pulau Pom pom, 180 feet (54^{m}9) high to the tops of the trees, lies on the western side of Alice channel, about 3 miles west-north-westward

Charts 2576, 2660b, 1263.

Chart 1680.

of Pulau Kapale; it is fringed by a narrow steep-to reef. A reef, on which there is a sandbank, which dries 3 feet ($0^{m}9$), lies about 2½ miles north-westward of Pulau Pom pom; the reef is steep-to, except off its southern extremity, from which a spit, with depths of less than 5 fathoms ($9^{m}1$) over it, extends about 4 cables southward.

Mantabuan islet, about 100 feet ($30^{m}5$) high to the tops of the trees, lies on the southern end of a detached reef about 4½ miles north-westward of Pulau Pom pom; the reef encloses a lagoon, and extends a quarter of a mile south-eastward from the islet.

Fremantle shoal, over which there is a least depth of 8 fathoms ($14^{m}6$), coral, lies about 6 miles northward of Mantabuan islet.

Richards reef, about 6 miles north-westward of Mantabuan islet, consists of a group of reefs, the outer edges of which are awash. On the north-western and north-eastern sides the reefs are not steep-to, but elsewhere the reef rises abruptly from depths of 40 fathoms ($73^{m}2$) and above.

Charts 1680, 1681.

Tidal streams.—The tidal streams in Alice channel run strongly, especially in the vicinity of Panguan islet (*Lat. 4° 43′ N., Long. 119° 02′ E.*) and Bajapa reef, and set straight through the channel between the steep-to edges of Alice and Bajapa reefs. In Alice channel the streams set southward and westward, and northward and eastward, at a maximum rate of from 2 to 2½ knots.

Chart 1681.

Bum-Bum island. — Dangers. — Bum-Bum island is flat and densely wooded, the tops of the trees being from 150 to 170 feet ($45^{m}7$ to $51^{m}8$) high. The western side of the island is known as Kubong, and is separated from the eastern extremity of the mainland by a narrow channel, named Trusan Tando-Bulong, which is described on page 173. The coastline is mostly composed of low cliffs of upraised coral. On the northern coast and at the eastern end of the island there is much mangrove, and there are several low, off-lying islets on the fringing reef of sand and coral, which dries in patches, and which extends from 1½ to 2 miles from the northern side.

There are several villages on the northern side and two on the south-eastern side, about one and 1½ miles, respectively, from Panto Panto point.

Charts 1680, 1681.

Islands and dangers northward and eastward of Bum-Bum island.—Pulau Puan, a flat-topped, wooded island, 130 feet ($39^{m}6$) high to the tops of the trees, lies 7 miles north-eastward of Panto Panto point, and near the northern end of a reef which extends about 2½ miles south-south-eastward from the island, and dries from one to 2 feet ($0^{m}3$ to $0^{m}6$) in patches. A small sand cay, which dries 2 feet ($0^{m}6$), lies near the southern end of the reef. The reef is steep-to on all sides, except at its southern extremity, from which a bank, with depths of less than 10 fathoms ($18^{m}3$) over it, extends about three-quarters of a mile.

Baturua reef, which dries from one to 2 feet ($0^{m}3$ to $0^{m}6$) in patches, lies westward of Pulau Puan, and is separated from the reef on which that island lies by a deep channel half a mile wide. From the northern extremity a bank of irregular depths extends northward for about three-quarters of a mile. A spit extends a short distance from the

Charts 2576, 2660b, 1263.

Charts 1680, 1681.

southern extremity of the reef and a 3-fathom (5^m5) patch lies half a mile south-eastward of it.

The tidal streams run very strongly round Baturua reef, and care is necessary in rounding it to avoid being set too near the edge.

Bulipatuid shoal, over which there is a least known depth of 4½ fathoms (8^m2), lies about 1¾ miles south-westward of Baturua reef. As it is possible there may be a less depth, vessels should not cross this shoal.

The north-eastern extremity of Sabankat islet in line with Mount Tanna Ballu (*Lat. 4° 40′ N., Long. 118° 28′ E.*), Timbu Mata island, bearing 297°, leads north-eastward of Bulipatuid shoal.

Pasalat reef, awash, lies about 4¼ miles westward of Baturua reef, and is separated from the edge of the reef extending from the northern side of Bum-Bum island by a deep channel about three-quarters of a mile wide. A bank, with depths of from one to 3 fathoms (1^m8 to 5^m5) over it, extends about one mile eastward and a similar bank the same distance westward from Pasalat reef.

Chart 1680.

Pulau Gaia and Bohi dulong, two high, densely wooded islands lying on the same reef, and almost united, are the most prominent landmarks seen on approaching Darvel bay, and together with Timbu Mata island, are visible from the northern part of Sibuko bay over the low islands southward of them; they were uninhabited in 1891. *See* view A on chart 1680, also views facing this page.

Bohi dulong island, situated about 8 miles northward of Panto Panto point (*Lat. 4° 27′ N., Long. 118° 45′ E.*), has a prominent peak, 1,200 feet (365^m8) high near its southern extremity. The south-western part of Pulau Gaia rises to a peak, 1,540 feet (469^m4) high, with two slightly lower peaks close to it, presenting remarkable outlines, especially when seen from northward and eastward. The eastern part of Pulau Gaia culminates in a prominent peak, 1,240 feet (378^m0) high; the land between the eastern and western parts being low causes Pulau Gaia to appear as two islands from some directions.

A shoal, with a least depth of 4½ fathoms (8^m2) over it, lies about 1¼ miles north-north-eastward of the eastern extremity of Bohi dulong island; between it and the reef on which the island lies there is a deep channel about three-quarters of a mile wide.

Tatagan island, close southward of the south-western extremity of Pulau Gaia, is 320 feet (97^m5) high, and partly cleared at its summit; at the northern end there is a village.

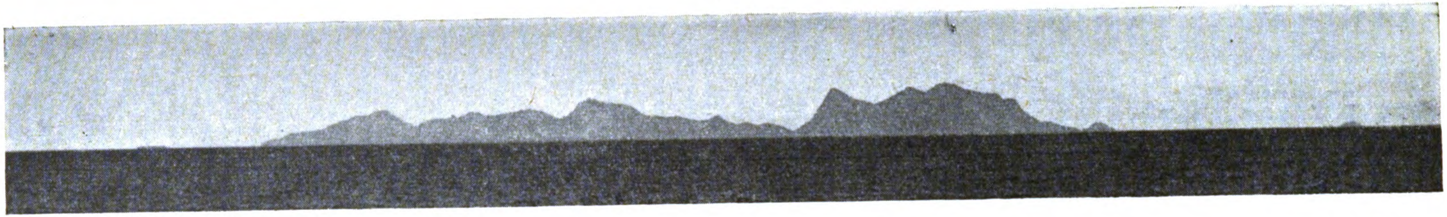
The reef around Pulau Gaia extends on the north-western side to a distance of nearly 1¼ miles from the island, and there assumes the form of a barrier reef enclosing a lagoon full of shoal patches. In the lagoon on the southern side of Pulau Gaia there are depths of from 7 to 16 fathoms (12^m8 to 29^m3), and there is a fairly clear space in the middle.

The entrance to this lagoon, which lies southward of Tatagan island, is less than one cable wide, with a depth of 3½ fathoms (6^m4); there are no marks for entering it and only vessels with local knowledge should attempt it. These vessels may obtain anchorage, in a depth of about 10 fathoms (18^m3), sand, out of the tidal stream, eastward of the village.

Anchorage may be obtained outside the lagoon, in a depth of

Charts 2576, 2660b, 1263.

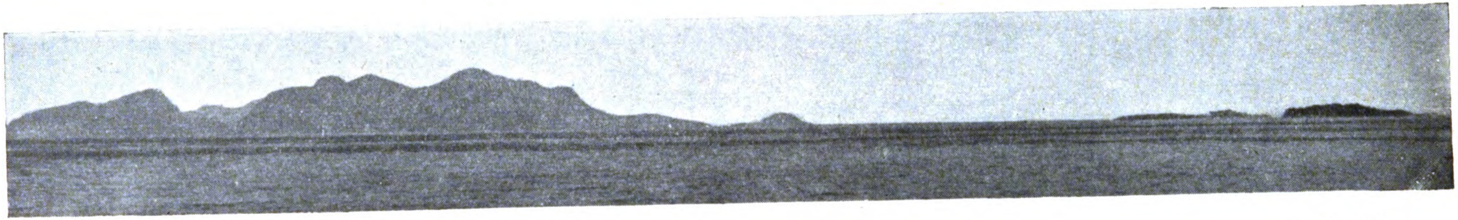
To face page 160.



Mantabuan I.

Summit, bearing 176°, distant 11½ miles.

Sibuan I.



Summit, bearing 132°, distant 7½ miles.

Sibuan I.

Two views of Pulau Gaia.

(*Original dated* 1918.)

Chart 1680.

10 fathoms (18^{m}3), with Tatagan island bearing 036°, distant half a mile, but the tidal streams run strongly here.

Salakan and Sabankat islets lie on an extensive reef midway between Pulau Gaia and Larapan island. Salakan, 240 feet (73^{m}2) high, and wooded, lies on the south-eastern part of the reef, about 1½ miles south-westward of Tatagan island. Sabankat, with the tops of the trees 160 feet (48^{m}8) high, lies at the south-western extremity of the reef. Two rocks, about 5 feet (1^{m}5) high, lie on the reef about 1½ miles northward of Sabankat. The passage between the eastern edge of the reef and the reef on which Pulau Gaia lies is three-quarters of a mile wide.

Maiga islet, 125 feet (38^{m}1) high, lies on the south-western edge of a detached reef, 1½ miles north-north-westward of Salakan islet. There is a deep channel nearly one mile wide between this reef and the reef on which Pulau Gaia lies.

Sibuan islet, 150 feet (45^{m}7) high, and wooded, lies on the southern end of a reef, separated by a deep channel three-quarters of a mile wide from the northern edge of the extensive reef on which Salakan and Sabankat islets lie. *See* view facing page 160.

Church reef, awash, lies north-westward of Sibuan islet, and is separated from the reef on which that islet lies by a deep channel about 8½ cables wide.

Charts 1680, 1681.

Langas island, about 4¼ miles north-westward of the north-western point of Bum-Bum island, is flat-topped and wooded, with a single prominent hill, 360 feet (109^{m}7) high at its south-western end. A reef extends from half a mile to one mile from the northern end, leaving a channel three-quarters of a mile wide between it and the fringing reef eastward of Tanjong Timbu Mata (*Lat.* 4° *35′ N., Long.* 118° *33′ E.*), the south-eastern extremity of Timbu Mata island. The channel between Langas and the coast of Borneo is half a mile wide, and between Langas and another island westward of it nearly one mile wide, with a least depth of 3½ fathoms (6^{m}4) in the fairway, but there is a rock, with a depth of 3 feet (0^{m}9) over it, about half a mile south-westward of the south-western extremity of Langas island. A bank, with depths of less than 3 fathoms (5^{m}5) over it, extends from 3 to 8 cables eastward of the island westward of Langas island; to keep in the greatest depths the south-western point of Langas island should be rounded at a distance of about 2 cables.

Chart 1680.

Larapan island, about 200 feet (61^{m}0) high to the tops of the trees, lies nearly one mile eastward of Langas island, but the navigable channel between them is only a quarter of a mile wide; the edges of the reef on both sides of the channel are irregular and broken. There is a village on the western side of the island.

Sigalong trusan.—Dangers.—Sigalong trusan, which separates Timbu Mata island from the mainland is narrow and tortuous, has a least width of about 6½ cables, and is only navigable for small craft with local knowledge; near the middle there is a mud flat extending across the channel, with a depth of 1½ fathoms (2^{m}7).

Tanjong Timbu Mata is formed by a spur from the mountains extending southward from the eastern end of Timbu Mata island. Near the water's edge it is bordered with trees, and there are a few on

Chart 1680.

the upper part of the ridge. A spit, with depths of less than 3 fathoms ($5^{m}5$) over it, extends a quarter of a mile southward from the point.

A shoal, with a least depth of 3½ fathoms ($6^{m}4$) over it, lies half a mile from the edge of the reef between Tanjong Sidongal and Tanjong Timbu Mata, and 2½ miles east-north-eastward of the latter point; vessels should pass southward of this shoal. The south-eastern extremity of the islet, 70 feet ($21^{m}3$) high, situated about three-quarters of a mile south-south-westward of Tanjong Timbu Mata, in line with the south-eastern extremity of a wooded island, 2¼ miles west-south-westward, bearing 252°, leads southward of this shoal and through the fairway into Sigalong trusan.

Chart 1681.

Sigalong river flows into the south-eastern part of Sigalong trusan, about 3½ miles south-westward of Langas island; it runs northward and drains the country eastward of Mount Sinalong. It is broad and deep within the entrance, with depths of 4 fathoms ($7^{m}3$) for some distance, but on the bar at the mouth there was, in 1891, only a depth of 3 or 4 feet ($0^{m}9$ or $1^{m}2$). The banks are bordered with nipa palms and the steam cutter of H.M.S. *Egeria*, in 1891, ascended the river for 5 or 6 miles, finding it free from snags and other obstructions.

Chart 1680.

Pyramid hill is a remarkable pyramidal-shaped hill, 1,050 feet ($320^{m}0$) high, lying close to the coast about 7 miles west-north-westward of the south-western point of Langas island. It is the northernmost peak of an isolated range of hills occupying the peninsula on the eastern side of Sipit river, which flows into the southern side of Sigalong trusan, close westward of Pyramid hill. The entrance is fronted by a broad flat, over which, for a distance of 2 miles, the depth was, in 1891, only about 2 feet ($0^{m}6$), deepening within to 3 and 4 fathoms ($5^{m}5$ and $7^{m}3$); but although there are several arms in which the depths are considerable, they are all so narrow at from 2 to 3 miles from the entrance that no craft but a canoe can proceed farther.

Anchorages.—In 1892, H.M.S. *Egeria* anchored in a depth of 12 fathoms ($21^{m}9$), with Tanjong Timbu Mata (*Lat. 4° 35′ N., Long. 118° 33′ E.*), bearing 267°, distant half a mile.

Westward of Tanjong Timbu Mata the coast forms a bay, but it is too much encumbered by reefs to admit of its being entered very far. A vessel could, however, doubtless anchor out of the tidal stream, in a depth of 6 or 7 fathoms ($11^{m}0$ or $12^{m}8$), with the southern extremity of the point bearing 079°, distant half a mile, by passing between the shoal water off the point and the reef fringing the small islet three-quarters of a mile south-westward; but this anchorage has not been examined closely.

Timbu Mata island.—Timbu Mata island is densely wooded and mountainous, rising from a low western point to Mount Tanna Ballu near its centre, a sharp conical peak, 2,035 feet ($620^{m}3$) high, and a prominent landmark. At the eastern extremity, Mount Sidongal, a conical mountain, 1,605 feet ($489^{m}2$) high, is also prominent. *See* view A on chart 1680.

A reef extends about 3½ cables eastward from the southern side of Tanjong Sidongal, the eastern point of the island, and curves south-westward to Tanjong Timbu Mata; on this reef are two low islets,

Charts 2576, 2660b, 1263.

Chart 1680.

Northern side of Timbu Mata island.—Between Tanjong Sidongal and the northern extremity of Timbu Mata island the north coast is deeply indented by bays, which, however, are greatly encumbered by reefs, and the approaches to them are very foul. Vessels should not approach this coast within depths of 20 fathoms ($36^{m}6$).

Balusuan islet, 60 feet ($18^{m}3$) high, lies about 1½ miles from the northern side of Timbu Mata island, and 4 miles north-westward of Tanjong Sidongal. Southward of the islet and on the coastal reef is a larger islet, 250 feet ($76^{m}2$) high. Patches of foul ground and reef extend to a distance of 6 cables northward and eastward of Balusuan islet, and thence in a south-easterly direction for about 3¾ miles towards Tanjong Sidongal; this foul ground projects upwards of one mile from the Timbu Mata coast. Vessels should not attempt to pass southward of Balusuan islet.

Pulau Bati Laut, 795 feet ($242^{m}3$) high, is separated from the northern extremity of Timbu Mata island by a channel, 2 cables wide, with a depth of 3½ fathoms ($6^{m}4$) in the middle.

Pulau Bati, close off the north-western side of Timbu Mata island, is 805 feet ($245^{m}4$) high, and densely wooded, and has two indentations on its southern side. The coasts are bordered with mangrove. A reef extends a quarter of a mile north-westward from the western extremity of the island and there is foul ground between the southern side of the island and Timbu Mata island.

Between the southern side of Pulau Bati (*Lat. 4° 42′ N., Long. 118° 25′ E.*) and the northern side of the western end of Timbu Mata island, a bay is formed, at the head of which vessels may obtain anchorage, in a depth of 13 fathoms ($23^{m}8$); on the southern side of the bay there are some small off-lying reefs and shoals. Hambly reef, awash, lies nearly in the middle of the entrance to this bay; close off the northern end of the reef is a rock which dries 5 feet ($1^{m}5$). Southward of the reef and about 3½ cables from the coast of Timbu Mata island, there is an islet, 210 feet ($64^{m}0$) high, with a reef extending 2 cables west-north-westward from its northern side.

Islands and dangers northward and north-westward of Timbu Mata island.—Adal island is a prominent conical, wooded island, 360 feet ($109^{m}7$) high, situated 2¾ miles north-eastward of Pulau Bati Laut. It is fringed by a narrow reef and a sand spit, which dries about 7 feet ($2^{m}1$), extending about a quarter of a mile south-westward from its southern extremity.

Bakuhang, Bankauhang, and Gatahang are three islets lying on reefs which are nearly joined. Bakuhang, 285 feet ($86^{m}9$) high, is the easternmost and largest, and lies about 1½ miles west-north-westward of Adal island, with a deep channel between them. Gatahang, the westernmost, and smallest of the group, is 68 feet ($20^{m}7$) high, with a solitary tree on its summit; a reef extends 4 cables westward from the islet.

Tabauwan is the largest and easternmost of a group of thickly wooded islands occupying the western part of Darvel bay. Being higher than the other islands of the group and lying well offshore, it may be easily identified when approaching from eastward; it lies about 4 miles north-westward of Pulau Bati Laut, and rises about the middle to two peaks, the western of which is 905 feet ($275^{m}8$) high and shows sharply from all directions, and the eastern, 910 feet ($277^{m}4$)

Charts 2576, 2660b, 1263.

Chart 1680.

high. There is very little fringing reef, except near the south-eastern end, where a tongue of reef extends over 2 cables southward.

Near the middle, on the southern side of Tabauwan, a bay, about 3½ cables wide at its entrance, is formed between two promontories extending south-south-westward from the slopes of the two peaks; there are depths of from 13 to 20 fathoms ($23^{m}8$ to $36^{m}6$) in the middle, but the head of the bay is foul for nearly a quarter of a mile offshore.

Silumpat island, 550 feet ($167^{m}6$) high, and wooded, lies 2 cables southward of the eastern entrance point of the bay on the southern side of Tabauwan. It is nearly divided into two parts, being only connected by a low narrow neck of land near the northern end.

Bohihan, an island 780 feet ($237^{m}7$) high, lies about 2 miles westward of Tabauwan. A narrow reef lies in the passage between the western point of Bohihan and Pulau Tanna, about three-quarters of a mile south-westward. Palundangan, an island, 330 feet ($100^{m}6$) high, lies 3 cables southward of Bohihan, with a small reef between them.

Majinkil and Bakuhang islets, the former about 4 cables southward of Palundangan, and 430 feet ($131^{m}1$) high, lie about 2 cables apart. An islet, 33 feet ($10^{m}1$) high, lies near the edge of a reef about 3 cables westward of Majinkil.

Maganting island is the westernmost of this group, and lies about one mile west-north-westward of Bohihan; it is 385 feet ($117^{m}3$) high, with a hill at either end and a slight depression between. There is a small reef about 3½ cables off the middle part of the southern side of Maganting island.

Little reef (*Lat. 4° 51′ N., Long. 118° 16′ E.*), awash, lies about 2 miles north-north-westward of Maganting island.

Learmonth reef, nearly awash, lies about 1½ miles northward of Pulau Bati, and usually shows clearly.

Pudsey reefs are two small reefs awash, about 1½ miles apart, north and south; the northern reef lies about 2¼ miles westward of the southern point of Silumpat island. Dawson rock, with a depth of one fathom ($1^{m}8$) over it, is a small pinnacle rock near the western end of a narrow bank, and steep-to, situated about 3 miles west-south-westward of Silumpat island.

Normanhurst reef, about 6 cables south-south-westward of Bakuhang islet, may be passed on either side close-to. The western extremities of Pulau Tanna and Maganting island in line, bearing 343°, leads close westward of this reef, and eastward of Rashleigh and Sheppard reefs.

Walton, McKinlay, Rashleigh, Sheppard, and Lawler reefs are all small coral patches, which nearly dry, forming a chain from a position 3 miles westward of Pulau Bati for 7¼ miles north-westward.

Nichols reef, a small coral patch nearly awash, lies 2¼ miles west-south-westward of the north-western extremity of Maganting island.

Coast.—Dangers.—Between the western entrance point of the western end of Sigalong trusan and the entrance to Sungei Madai, 7½ miles north-westward, the coast is bordered with mangroves, and there are several off-lying reefs.

A 3-fathom ($5^{m}5$) patch lies one mile northward of the western extremity of Timbu Mata island.

Merrett reefs lie on a line extending northward for about 2½ miles from the western entrance point of Sigalong trusan. A rocky patch

Charts 2576, 2660b, 1263.

Chart 1680.

with a depth of less than 6 feet ($1^{m}8$) over it, lies a quarter of a mile eastward of these reefs, and about 1¾ miles northward of the same point.

Greep reefs are three detached reefs, separated by deep water, lying from about three-quarters of a mile to 2 miles offshore and about 4¾ miles north-westward of the western extremity of Timbu Mata island.

Sungei Madai leads to the Birds' Nest caves, and is navigable by boats for a distance of about 1½ miles. A small mangrove islet lies three-quarters of a mile eastward of the entrance, at the end of a spit of sand and mud which dries, and from the islet a broad tongue of reef extends three-quarters of a mile northward; the passage into the river lies between this reef and the coastal reef. At the mouth of the river there was, in 1891, a depth of from 3 to 4 feet ($0^{m}9$ to $1^{m}2$), deepening to 2 and 3 fathoms ($3^{m}7$ and $5^{m}5$) within.

Tagabua is a small wooded islet, 67 feet ($20^{m}4$) high, lying about 2¼ miles northward of the mangrove islet situated eastward of the entrance to Sungei Madai. Foul ground and detached reefs lie within about 4 cables west-north-westward, and one mile south-westward and south-eastward of the islet. Anchorage may be obtained, in a depth of 9 fathoms ($16^{m}5$), mud, with Tagabua islet bearing 047°, distant 1½ miles.

Between the mouth of the Sungei Madai and Skertchley point, 7 miles north-north-westward, there are two salt-water creeks. A ridge of coastal hills, from 285 to 395 feet ($86^{m}9$ to $120^{m}4$) high, runs parallel with the coast for 2 miles from the northern entrance point of Sungei Madai; this ridge assists in identifying the river entrance. Skertchley point (*Lat. 4° 50′ N., Long. 118° 10′ E.*) is a low mangrove point, from which a spit of sand and mud, which dries, extends about three-quarters of a mile north-north-eastward; it should not be approached too closely, as its outer edge is steep-to, and soundings give little warning. Ting-kaiu river, which is too shallow to admit boats, flows out close southward of the point.

Moorhen reefs are four small reefs, the southernmost of which lies about 2¼ miles north-north-eastward of Skertchley point.

The summit of Hastings point, situated 2½ miles northward of Skertchley point, in line with the western Stewart peak, bearing 301°, leads south-westward of Moorhen reefs; and the summit of Pulau Babi, bearing 038°, situated on the eastern side of Silam harbour, open south-eastward of Giffard islet, leads close south-eastward of the reefs.

Lamak bay, entered between Skertchley and Hastings points, affords anchorage, in depths of from 5 to 8 fathoms ($9^{m}1$ to $14^{m}6$), mud. Hastings point may be identified by a prominent small wooded knoll, 260 feet ($79^{m}2$) high, near its extremity. Some small detached reefs lie between the point and Moorhen reefs.

The southern and western sides of Lamak bay are bordered by extensive mud flats, the 3-fathom ($5^{m}5$) line extending upwards of one mile offshore in places, but there are greater depths in the north-western corner. The rivers Divatu, Magul, Sibahong, and Ladong flow into the bay; none of them is sufficiently wide or deep to allow boats to ascend them for any considerable distance, and they cannot be entered at all except at high water.

Between Hastings point and Tanjong Batu, about 3½ miles north-

Charts 2576, 2660b, 1263.

Chart 1680.

eastward, the coast is fronted by several small detached reefs lying within 2¼ miles offshore, within which distance it is not prudent to navigate.

Chart 1593.

Silam harbour.—Silam harbour, in the north-western part of Darvel bay, lies between the western end of Sakar island and Tanjong Batu, nearly 7 miles west-south-westward. A line of detached reefs extends from the south-western side of Sakar island in a south-westerly direction for about 4¾ miles, terminating in Adams reef; this line of reefs encumbers the eastern approach to Silam, situated on the north-western shore of the harbour. Pulau Kalung Kalungun, lying on one of these reefs about the middle of the chain, indicates the main entrance, which is immediately northward of this island. *See* Directions, page 168.

Pulau Babi, near the middle of the harbour, and the Saddle islands south-westward of it, protect the anchorage off Silam.

On the northern shore of the harbour is Soai Soaiun bay, about 4½ cables wide at its entrance; it branches into two arms at the head, which is shallow. In the outer part of the bay there are depths of 7 and 8 fathoms ($12^{m}8$ and $14^{m}6$), but there is barely room for a vessel to swing.

The shore on the north-eastern side at the entrance may be approached within a distance of one cable, but from the islet forming the south-western entrance point foul ground and reefs extend east-south-eastward for 3 cables in the direction of Woodhall reefs.

Mark hill (*Lat. 4° 59′ N., Long. 118° 12′ E.*), with a well-defined summit, 1,530 feet ($466^{m}3$) high, lies about 1½ miles north-westward of Silam pier, to which a long spur extends. It is easily identified as it is the first summit showing on the sky-line north-eastward of Mount Silam.

Mount Silam, a flat-topped wooded mountain, 2,920 feet ($890^{m}0$) high, lies about 2½ miles westward of Silam pier. It is the highest mountain within many miles, and stands up boldly, being separated by a deep valley from the other mountains westward and southward of it, and sloping steeply north-eastward; the ridge rises again to Mark hill and continues eastward as a coastal range with a gradually diminishing altitude. *See* view B on chart 1680.

Tanjong Batu is the eastern extremity of a low range of coastal hills.

Silam village is approached through a channel which is marked by stakes for the Government launch.

Islands and dangers.—Pulau Kalung Kalungun, 145 feet ($44^{m}2$) high, with a rounded summit, lies about 2¾ miles south-westward of the south-western extremity of Sakar island; it lies on a reef which extends from a quarter to three-quarters of a cable from the island.

Misan Misan reef, awash, and occasionally difficult to discern, lies 9 cables north-north-eastward of Pulau Kalung Kalungun. The south-western extremity of Pulau Babi in line with Mark hill, bearing 299°, leads south-westward of Misan Misan reef, and the north-eastern extremity of Pulau Babi in line with Mark hill, bearing 296°, leads between Misan Misan reef and the reefs eastward of it.

Pulau Babi, densely wooded, with a remarkable conical summit, 410 feet ($125^{m}0$) high near its south-eastern end, may be easily identified on approaching the harbour. There is very little fringing reef off its

Charts 1680, 2576, 2660b, 1263.

Chart 1593.

south-western and eastern sides, but from its north-western point a tongue of reef, with some white rocks, one foot (0^{m}3) high, at its outer end, extends 3½ cables north-westward.

Woodhall reefs are two detached coral reefs, which dry one foot (0^{m}3), lying about half a mile from the northern shore of the harbour, northward of Pulau Babi.

A narrow detached reef lies 2 cables northward of the north-eastern extremity of Pulau Babi, and narrows the channel between it and the Woodhall reefs to a width of 3 cables. Wise hill, 460 feet (140^{m}2) high, situated about one mile north-eastward of Silam pier, in line with Mark hill, bearing 290°, leads midway between these reefs.

Gusong dilaut, a reef awash, lies 4 cables westward of Pulau Kalung Kalungun, with a clear passage 3 cables wide between them. The eastern extremity of Pulau Babi in line with Kissing hill, 540 feet (164^{m}6) high, bearing 356°, leads between Gusong dilaut and Pulau Kalung Kalungun.

Wanderer reef, awash, lies about 8 cables south-westward of Pulau Kalung Kalungun. Adams reef lies about 5½ cables west-south-westward of the southern extremity of Wanderer reef; there is a small sandbank at its eastern extremity, which dries 2 feet (0^{m}6), at which time the remaining part of the reef is awash. The western extremity of Pulau Sumabun, of the Saddle islands, in line with Mark hill, bearing 330°, leads south-westward of Adams reef; and the eastern extremity of Giffard islet, the south-easternmost of the Saddle islands, in line with the north-western extremity of Pulau Babi, bearing 024°, leads westward of the reef.

Kiddle reefs, 1¼ miles south-south-eastward of Tanjong Batu (*Lat. 4° 56′ N., Long. 118° 12′ E.*), are two reefs, with a depth of 2 fathoms (3^{m}7) between them. Foul ground extends about 1¼ cables southward from the eastern reef, and there is a 4-fathom (7^{m}3) patch about 1½ cables northward of the same reef, with deep water between. Mark hill, bearing 347°, open eastward of Pulau Saranga, leads eastward of Kiddle reefs.

The Saddle islands are a chain of six wooded islands extending from about half a mile to 2¾ miles south-eastward from Pulau Bayan, 335 feet (102^{m}1) high, situated about half a mile south-south-westward of Silam.

Pulau Sagai, 195 feet (59^{m}4) high, and the westernmost, lies on a reef separated by a narrow passage from the reef extending from Pulau Sumabun, the next island. Pulau Sumabun, 280 feet (85^{m}3) high, is connected to Nipa Nipa, 200 feet (61^{m}0) high, the next island south-eastward. Pulau Tabauwan, connected by a reef with Nipa Nipa, is 305 feet (93^{m}0) high near its centre, and Giffard islet, 120 feet (36^{m}6) high, lies 2¼ cables south-eastward of Pulau Tabauwan, with another islet between them, all lying on the same reef, which extends one cable eastward from Giffard islet.

Power spit, a coral ledge, extends 3½ cables north-westward from the northern extremity of Pulau Tabauwan.

Pulau Saranga, consisting of two wooded hills, the southern of which is 260 feet (79^{m}2) high, lies with its southern extremity 4 cables eastward of Tanjong Batu. The island is fringed by a reef which extends 2 cables from the southern end. The passage between the island and Tanjong Batu is encumbered by reefs.

Charts 1680, 2576, 2660b, 1263.

Chart 1593.

A small detached reef lies 3½ cables eastward of the southern part of Pulau Saranga.

Anchorage.—The anchorage off Silam is over a very uneven bottom of sand and coral, and is encumbered with three coral heads, with a depth of 4 fathoms (7m3) over them, in the southern part of the anchorage, and Holmes rock, with a depth of 3 fathoms (5m5) over it, lying half a mile northward of the northern extremity of Pulau Sumabun. A large vessel should anchor outside these patches, in a depth of from 15 to 16 fathoms (27m4 to 29m3), but a moderate sized vessel may obtain anchorage on the banks within them. The edge of the shore reef off Silam is very irregular and broken up into patches.

A good berth for a small vessel is in a depth of 10 fathoms (18m3), sand and coral, with the northern extremity of Pulau Babi in line with the southern extremity of the southernmost islet, 125 feet (38m1) high, off the south-western end of Sakar island, bearing 095°, and the western extremity of Pulau Sagai in line with the eastern extremity of the southern part of Pulau Saranga, bearing 199°.

A sheltered anchorage may be obtained, in a depth of from 8 to 10 fathoms (14m6 to 18m3), mud, in the bight on the northern side of Tanjong Batu (*Lat. 4° 56′ N., Long. 118° 12′ E.*), with the northern extremity of that point bearing 154°, distant half a mile.

Directions.—The anchorage off Silam may be approached by passing either northward or southward of the Saddle islands. The approach from eastward passing northward of the islands is quite clear after passing Kalung Kalungun, but Power spit must be avoided. The passage from southward is 4 cables wide between Pulau Sagai and Pulau Bayan, and is quite clear except for the fringing reef which extends about 1½ cables from the mainland.

Charts 1593, 1680.

A vessel approaching Silam from eastward should pass Darvel peninsula at a distance of not less than 2 miles, thence steer for Pulau Kalung Kalungun, and pass about 3½ cables northward of that island, thence steer for Mark hill, bearing 305°, until the northern extremity of Pulau Babi is in line with the southern extremity of the southernmost islet, 125 feet (38m1) high, off the south-western end of Sakar island, bearing 095°, when she should keep these marks in line, astern, which will lead to the anchorage for small vessels, passing about 1¼ cables northward of Holmes rock.

Chart 1593.

A vessel approaching Silam from southward should, from a position with the eastern extremity of Giffard islet in line with the north-western extremity of Pulau Babi, bearing 024°, and the western extremity of Pulau Sagai in line with Mark hill, bearing 338°, steer for the latter, being careful not to open Mark hill westward of Pulau Sagai; this course leads a quarter of a mile eastward of the small reef lying eastward of Pulau Saranga. When Pulau Babi begins to show between Nipa Nipa and Pulau Sumabun she should alter course to round Pulau Sagai at a distance of from one to 2 cables, after which, bringing the western extremity of Pulau Sagai in line with the summit of the southern hill of Pulau Saranga, bearing 205°, she should steer with this mark on astern up to the anchorage, passing between the two westernmost of the 4-fathom (7m3) patches, and anchoring as convenient, as above.

Chart 1593.

Tidal streams.—The tidal streams off Silam are very weak, and appear to turn approximately at high and low water by the shore.

Chart 2576.

SIBUKO BAY.—Aspect.—Sibuko bay comprises that part of the eastern coast of Borneo between the eastern extremities of Bum-Bum island (page 159) and Pulau Mandul, 71 miles south-westward.

Charts 2099, 2576.

Westward of Kumpong river, the entrance to which lies about 26 miles west-south-westward of Panto Panto point, the eastern extremity of Bum-Bum island, the mountain system on the northern side of Sibuko bay centres in Mount Magdalena; this peak, which is densely wooded to its summit, is 4,420 feet (1,347^{m}2) high, and presents a sharp peak from all sides.

Chart 2099.

From Mount Magdalena a high backbone extends in a south-south-easterly direction for 15 miles, terminating in Chinaga Timor, 1¾ miles north-north-westward of Batu Tinagat. On this backbone there are several very prominent elevations, notably Mount Lucia, 4,070 feet (1,240^{m}5) high, Maria peak 3,680 feet (1,121^{m}7), Mount Andrassy 2,200 feet (670^{m}6), and Chinaga Timor 1,390 feet (423^{m}7) high, thus gradually diminishing in altitude towards the coast.

A secondary watershed branching at right angles from the main backbone springs from Mount Lucia (*Lat. 4° 28′ N., Long. 117° 57′ E.*); this secondary system curving round eastward, and lower in altitude, eventually terminates in Mount Wüllerstorf, 13½ miles east-south-eastward of Mount Magdalena, whilst westward it forms a high ridge, which, taking a southerly direction, terminates in Kukusan, a conspicuous hill, 730 feet (222^{m}5) high, close to the coast 2 miles north-north-westward of Tawau pier. On this ridge there are three other remarkable elevations.

The northernmost of these, about 3½ miles south-westward of Mount Lucia, is a high saddle, the south-western peak of which, 2,670 feet (813^{m}8) high, is slightly the higher; the next is Table mountain, 1,980 feet (603^{m}5) high, perfectly flat topped, as its name indicates, which is situated nearly midway between Mount Magdalena and Kukusan. From Table mountain a spur running in a north-westerly direction for 3¾ miles terminates in a prominent peak, Tiger hill, 1,550 feet (472^{m}4) high. The southernmost elevation is Gemok, a conspicuous flat-topped summit, 1,405 feet (428^{m}2) high, situated about 2¼ miles northward of Kukusan.

Lesser watersheds also branch away from Mount Magdalena in north-westerly and north-easterly directions.

Chart 1681.

Mount Wüllerstorf, 2,500 feet (762^{m}0) high, with a conical summit, is one of the most prominent peaks on the northern side of Sibuko bay. It slopes steeply eastward to the plains below, but a range of mountains from 2,115 to 1,680 feet (644^{m}6 to 512^{m}1) high, (the latter elevation being a remarkably sharp cone, 5¼ miles from Mount Wüllerstorf), stretches north-north-westward from it, between which and the low spurs of the mountains eastward is a valley 7 miles wide, through which Kumpong river takes its course. The entire district is covered with extensive forest. *See* views facing pages 170, 175 and 177.

Charts 2660b, 1263.

Charts 1681, 2099.

The principal landmarks on the northern side of Sibuko bay may be readily identified. The summits over 3,000 feet (914^{m}4) high, such as Mounts Magdalena and Lucia, and Maria peak, situated about 2¼ miles southward of Mount Lucia, are frequently obscured by clouds, but those of lower elevation are usually visible.

Chart 2099.

Quoin hill, 1,965 feet (598^{m}9) high, lies 4¼ miles east-south-eastward of Maria peak, and stands up prominently in the plain eastward of the main backbone running southward from Mount Magdalena.

Mount Andrassy, a rounded summit on the main backbone mentioned above, is the first prominent mountain northward of the Batu Tinagat hills. Immediately northward of Batu Tinagat there is a range of hills, from about 650 to 1,220 feet (198^{m}1 to 371^{m}9) high, and thickly wooded; Chinaga Timor is the northernmost and highest of the range. The northern slopes of these hills are steep, and they appear isolated from eastward.

Mount Putri, 1,020 feet (310^{m}9) high, is a spur of the Batu Tinagat range, and lies close to the coast, about one mile north-westward of Batu Tinagat. For light, *see* page 178.

Kukusan is a very remarkable pyramidal-shaped hill, and is quite unmistakable directly it opens out south-westward of Mount Putri when bearing 294°, and it remains clearly in view until it begins to close the higher land of Gemok behind. *See* view facing this page.

Chart 1681.

NORTHERN SIDE OF SIBUKO BAY AND APPROACHES.—

Coast.—Between Panto Panto point (*Lat. 4° 27′ N., Long. 118° 45′ E.*) and the south-western point of Bum-Bum island there is a bay fronted by an area with depths of from one to 2 fathoms (1^{m}8 to 3^{m}7), with many coral patches which dry. A reef extends 1½ miles eastward and three-quarters of a mile southward from Panto Panto point and nearly half a mile from the coast westward.

Beaufort reef, of sand and coral, and drying in patches, lies southward of the eastern part of Bum-Bum island, and is separated from the fringing reef of that island by a channel about 6½ cables wide. On the north-eastern end of Beaufort reef is Omadal islet, low and wooded, with the tops of the trees 150 feet (45^{m}7) high. There is a village at its north-western end, close westward of which there is an opening in the reef which affords access to canoes.

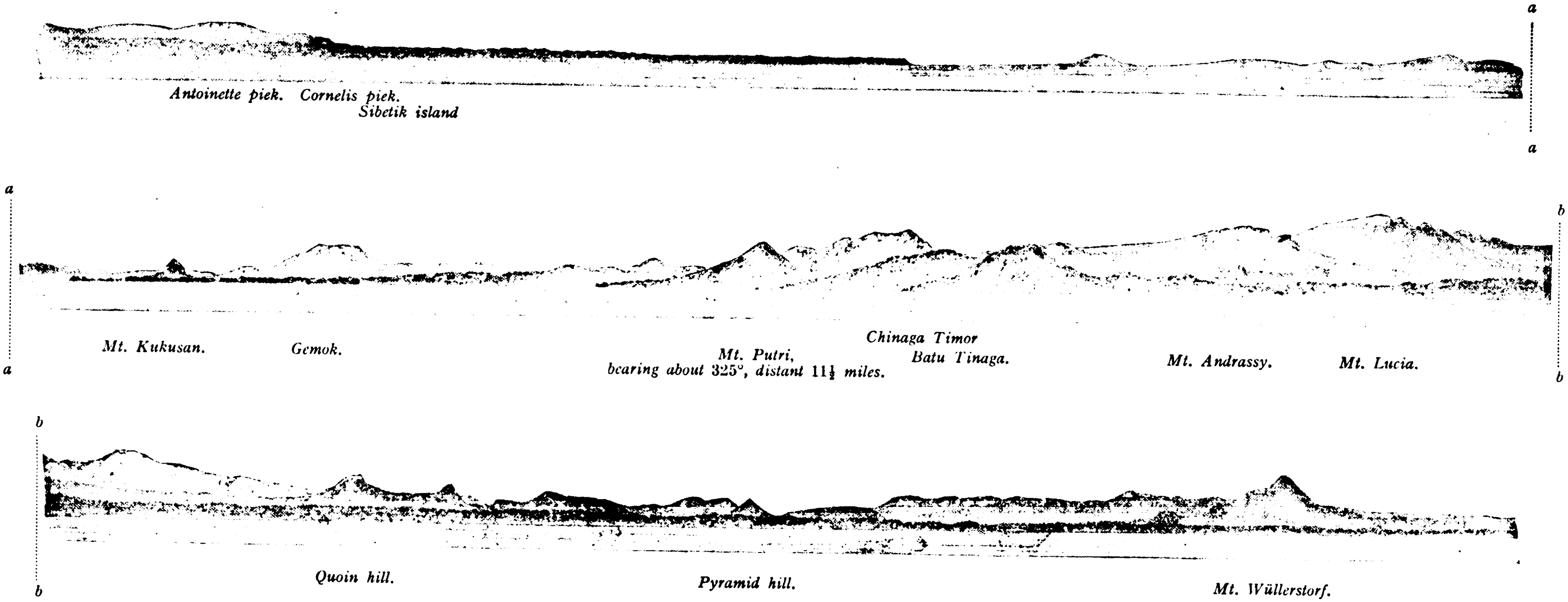
Two shoals, with depths of 3 and 3½ fathoms (5^{m}5 and 6^{m}4) over them, lie, respectively, about 2 miles eastward and 1¾ miles south-eastward of the eastern extremity of Omadal islet.

Creagh reef is an extensive flat of sand and coral, which dries in patches, extending about 5½ miles southward and 7½ miles south-westward from the south-western extremity of Bum-Bum island. On its north-western edge there are three thickly wooded islets, Manampili, Nusatonga, and Sipangao, from 345 to 415 feet (105^{m}2 to 126^{m}5) high, and near the middle of the northern part of the reef is a wooded islet, about 80 feet (24^{m}4) high. It is barely possible for a large boat to cross this reef at high water.

Silapag passage, between Beaufort reef on the east and Bum-Bum island and Creagh reef on the north and west, respectively, has a least

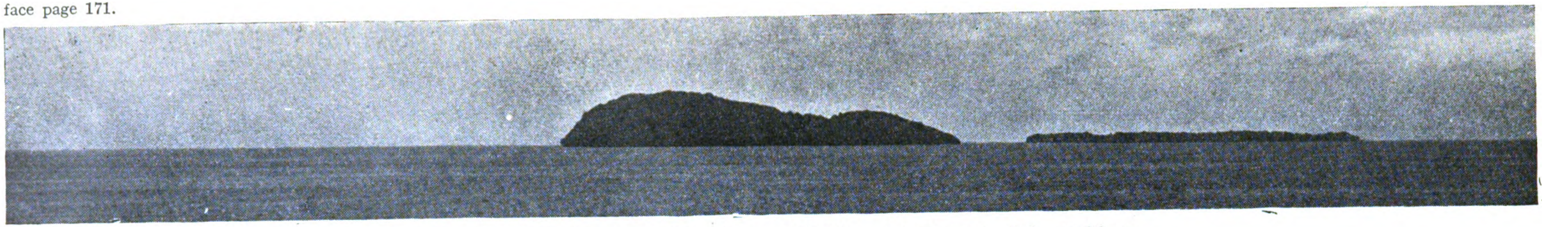
Charts 2576, 2660b, 1263.

To face page 170.

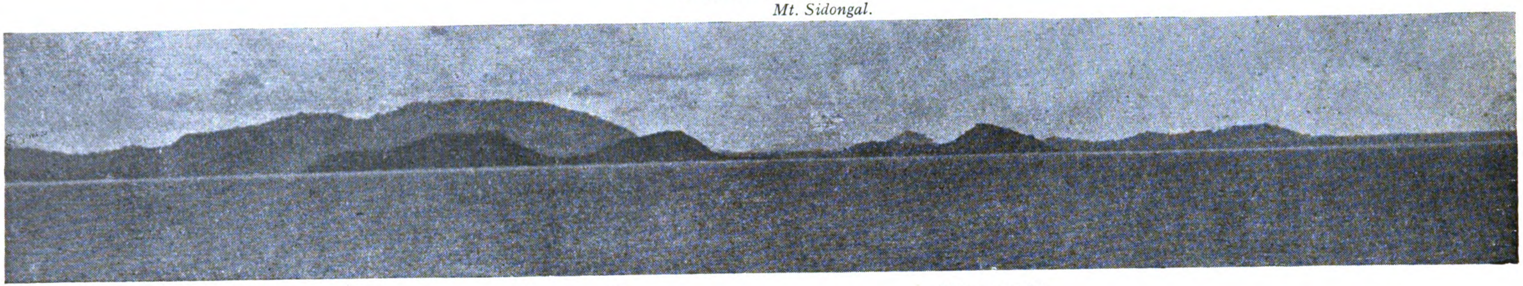


View, in three parts, of the northern shore of Sibuko bay, from south-eastward of Tawau.

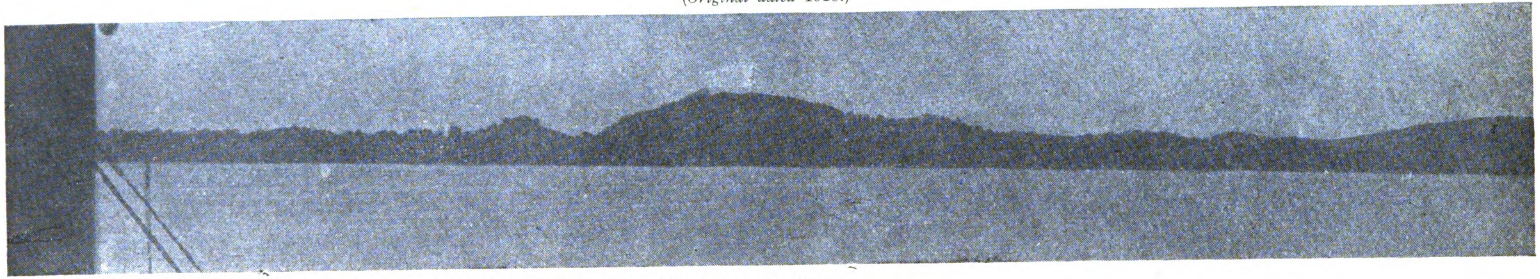
(*Original dated* 1893.)



Si Amil island, bearing 190°, distant 2½ miles.
(*Original dated* 1918.)



Southern approach to Ligitan channel. Western extremity of Sipangao islet in line with Mount Sidongal, bearing 356°.
(*Original dated* 1918.)



Northern approach to Trusan Tando Bulong.
(*Original dated* 1918.)

Chart 1681.

depth of 8 fathoms (14^{m}6) in mid-channel over a sandy bottom, and has a least width of a quarter of a mile near its southern end.

In 1886, H.M.S. *Satellite* anchored in this channel about 1½ cables from the village on Omadal islet, and found it an excellent anchorage, but the tidal streams run through at a considerable rate at springs.

Ligitan channel.—Dangers.—Beacon.—Ligitan channel, between Beaufort and Creagh reefs on the north and the Ligitan group on the south, has a least width of 1½ miles at its western entrance between the reef on which Gusungan islet lies and the easternmost of the Ligitan reefs. There are some patches, with depths of from 6 to 10 fathoms (11^{m}0 to 18^{m}3) over them, in the eastern part of the channel, and, except for Collins patch in the western part, no dangers have been discovered in or near the fairway, but the depths are very uneven northward and north-westward of Mabul island, on the southern side of the fairway, and vessels should avoid the shoaler parts of the banks shown on the chart.

Webb shoal, lying in the north-eastern approach to Ligitan channel, and 6½ miles eastward of Omadal islet, has a least depth of 5 fathoms (9^{m}1) over it, but it has not been examined with sufficient minuteness to justify vessels crossing it.

Ligitan group is a group of islets and reefs extending over a distance of 17 miles east and west. The area included within the limits of the group comprises on its eastern side an extensive reef, at the northern end of which lies Danawan island (*Lat. 4° 18′ N., Long. 118° 52′ E.*), and at the south-eastern part, Ligitan islet. The southern part of this reef dries in patches from one to 2 feet (0^{m}3 to 0^{m}6).

A bank, with depths of less than 5 fathoms (9^{m}1) over it, extends half a mile from the eastern edge of this reef, on which the sea breaks heavily, and along which there are tide-rips and heavy overfalls. The water in the vicinity being considerably discoloured, and the edge not having been closely examined, it should not be approached too closely.

A 2¾-fathom (5^{m}0) patch lies about half a mile southward of the south-eastern extremity of the reef.

Si Amil island, the north-easternmost island of the Ligitan group, is 355 feet (108^{m}2) high, and densely wooded. A sandy spit extends from its western side, and a reef, marked by a black and white beacon, surmounted by a white diamond, on its outer edge, extends 2 cables westward from the north-western extremity, leaving a deep passage 2 cables wide between it and the reef extending from Danawan island. *See* view facing this page.

Danawan island is 90 feet (27^{m}4) high, wooded, and flat-topped; the eastern point is a cliff, 55 feet (16^{m}8) high, and the northern point is the same elevation; on the western side there is a village. The island is only accessible to boats on the eastern side, where the reef closely approaches the coast.

Anchorage may be obtained, in a depth of 16 fathoms (29^{m}3), in a bay on the eastern side of Danawan island, 1½ cables offshore, protected by Si Amil island.

Ligitan islet, 1¾ miles northward of the southern extremity of the extensive easternmost reef of the Ligitan group, has a few bushes on it, 30 feet (9^{m}1) high, and is situated near the southern end of a narrow sandbank, which dries 4 feet (1^{m}2). A sandbank, which dries 3 feet (0^{m}9), lies about 2¾ miles northward of Ligitan islet.

Charts 2576, 2660b, 1263.

Chart 1681.

Off the southern end of the reef the tidal streams run at a rate of from 2 to 3 knots, causing heavy overfalls and whirls; caution should therefore be exercised in approaching the southern end of the reef, especially as the marks for fixing the position are distant.

Foul ground and shallow water extend westward for 2½ miles from the south-western extremity, and, as the sea does not generally break over the edge, which is very steep-to, it should be given a wide berth.

Cust reef, awash, lies on the southern side of the fairway of Ligitan channel, and 7½ miles westward of Danawan island. Several detached patches of reef lie about a quarter of a mile off the northern side of this reef, which should therefore not be approached closely, nor on passing it should a vessel get into depths of less than 10 fathoms ($18^{m}3$).

South-eastward of Cust reef, and separated from it by a narrow channel, is a larger reef, the edge of which has not been closely examined, but all sides appear to be foul to a distance of half a mile. The channel eastward of this reef, between it and a projecting spur of the easternmost reef of the group, is 2 miles wide, but although no detached patches were actually found in it, yet the survey of this portion of the group was of too cursory a character to justify vessels venturing in this channel or the other passages between these reefs.

Kapalai islet (*Lat. 4° 13′ N., Long. 118° 41′ E.*), a small sandy islet with some bushes on it, 40 feet ($12^{m}2$) high, lies on the north-eastern part of a detached reef, situated about 11½ miles south-westward of Danawan island. A sandbank, which dries 3 feet ($0^{m}9$), extends from either end of the islet.

The passage between the reef on which Kapalai islet lies and the foul ground off the south-western point of the large reef on which Danawan island lies is 1¼ miles wide, but is obstructed in the middle by a 5-fathom ($9^{m}1$) patch, and it is possible that there may be other patches with less depths.

Mabul island, the westernmost of the Ligitan group, lies about 3¼ miles west-north-westward of Kapalai islet; it is densely wooded, the tops of the trees being about 160 feet ($48^{m}8$) high, and is situated at the northern end of Mabul reef.

The passage between Mabul reef and the reef on which Kapalai islet lies is 2 miles wide, with depths of from 4 to 5 fathoms ($7^{m}3$ to $9^{m}1$) on either side, and 6½ fathoms ($11^{m}9$) in a narrow channel about one-third of the distance across from the Mabul side. No depth less than 4 fathoms ($7^{m}3$) was found on either side of the channel except close to the reefs, but the examination was not sufficiently exhaustive to determine that there is not a less depth, and therefore it would be well to use Mabul passage in preference.

Mabul passage, westward of Mabul island, is the channel between the Ligitan group on the east and Ligitan reefs on the west. It is 3½ miles wide, but is obstructed in the middle by a shoal, with a least depth of 3¼ fathoms ($5^{m}9$) over it; on the eastern side of the passage there is another shoal, with a least depth of 4¼ fathoms ($7^{m}8$) over it. The deepest part of the passage lies between these two shoals and carries a depth of from 7 to 8 fathoms ($12^{m}8$ to $14^{m}6$) right through.

The western extremity of Sipangao in line with Mount Sidongal, Timbu Mata island (chart 1680), bearing 356°, leads through Mabul passage and westward of Collins patch. (*See* view facing page 171.)

Collins patch, about 1½ miles north-westward of Mabul island, has

Charts 2576, 2660b, 1263.

Chart 1681.

a depth of 2¾ fathoms ($5^{m}0$) over it, and lies at the southern end of a bank of sand and coral extending within depths of 10 fathoms ($18^{m}3$) about 1½ miles northward and north-westward. Another coral patch, with a depth of 4¾ fathoms ($8^{m}7$) over it, lies three-quarters of a mile north-westward of Mabul island. The banks on which these two patches lie are about one cable apart with a depth of from 12 to 13 fathoms ($21^{m}9$ to $23^{m}8$) between them, and should not be crossed unless there is some necessity for it, as the depths over them are uneven, and it is possible that other shallow spots may exist, notwithstanding that it has been examined somewhat closely.

Gusungan, situated on the northern side of the western entrance to Ligitan channel, is a small sand cay, 3 feet ($0^{m}9$) high ; it lies on the north-western extremity of a reef, which partly dries.

Tidal streams.—In Ligitan channel the tidal streams run at a rate of one knot at springs.

Outlying island.—Sipadan island (*Lat. 4° 07′ N., Long. 118° 38′ E.*), 7½ miles southward of Mabul island, is wooded, and 165 feet ($50^{m}3$) high to the tops of the trees ; it lies on the north-western side of a reef which is steep-to. Turtle frequent the island in considerable numbers.

Trusan Tando-Bulong.—Trusan Tando-Bulong, between Bum-Bum island and Creagh reef on the east and the coast of Borneo on the west, has a least navigable width between the reefs on either side of about a quarter of a mile ; the edges of the reefs on each side are difficult to discern at times, and the tidal streams run with considerable strength. Vessels proceeding to Sibuko river from northward effect a great saving in distance by using this passage.

Except for a bank, with a depth of 5 fathoms ($9^{m}1$) over it, extending more than half way across the channel from the eastern side of the northern entrance, the least depth in the fairway is 7 fathoms ($12^{m}8$) near the southern entrance.

The settlement of Semporna is situated on the western side of Trusan Tando-Bulong, about 1½ miles south-westward of the north-western extremity of Bum-Bum island.

Daisy islet lies on the edge of the fringing reef on the eastern side of the channel, 2¼ miles southward of the north-western extremity of Bum-Bum island. Abreast the islet on the western side of the channel is a small inlet much encumbered by reef.

There is an inlet on the western side of Trusan Tando-Bulong, entered about 1¾ miles northward of Sipangao islet ; it extends in a north-north-westerly direction for about 1¾ miles, whence it divides into two arms, Kuli Babang on the south, and Lok Bakong on the north. On the eastern side of the latter is Lok Bakong hill, a remarkable conical hill, 595 feet ($181^{m}4$) high, forming the western end of a detached range of hills, the easternmost summit of which is Hood hill, 525 feet ($160^{m}0$) high. Mount Connor, 1,280 feet ($390^{m}1$) high, lies 1¼ miles westward of the south-western entrance point of the inlet. The entrance to the inlet is 1¾ cables wide between the reefs, with a depth of 6 fathoms ($11^{m}0$), which shoals to 3 fathoms ($5^{m}5$), three-quarters of a mile within. *See* view facing page 171.

The islets of Sipangao, Nusatonga, and Manampili have been described with Creagh reef on page 170.

Tagassan bay is a small inlet entered on the northern side of Tanjong

Charts 2576, 2660b, 1263.

Chart 1681.

Tutop, the western entrance point of the southern end of Trusan Tando-Bulong; the inlet is one mile wide between the entrance points, but the shore reef, which dries, extending 3 cables north-eastward from Tanjong Tutop, and a mud flat extending half a mile southward from the northern entrance point, narrow it considerably. On the northern entrance point there is some cleared grassy land where a village was formerly situated, and is now named Pakalangan.

Beacons.—White pile beacons, which are unreliable, are situated in the following positions:—

A beacon on the north-western edge of the reef extending about one mile northward from the north-western extremity of Bum-Bum island.

On the western edge of the reef extending from the north-western extremity of Bum-Bum island are two beacons, half a mile apart, similarly two beacons on the eastern edge of the reef northward of Semporna.

Five beacons on the eastern edge of the reef eastward of Hood hill and three on the south-eastern edge of the reef southward of Hood hill.

One on the northern side at the entrance to the inlet southward of Hood hill, on the southern extremity of the reef which extends from the eastern side of the entrance.

On the north-western edge of Creagh reef, about half a mile northward of Sipangao islet (*Lat. 4° 22′ N., Long. 118° 36′ E.*), and two beacons on the coral patch close off the western edge of Creagh reef, about half a mile north-westward of Sipangao islet.

Tidal streams.—Tides.—In Trusan Tando-Bulong the tidal streams set southward and northward, at a rate of from 3 to 4 knots at springs; they are strongest in the northern part of the channel between Bum-Bum island and the coast of Borneo.

The tides are affected by diurnal inequality, the greatest difference between two successive high waters being 2 feet ($0^{m}6$); this is attained when the moon is at her greatest, north or south, declination. When the sun is north of the equator the highest high water is the morning tide, and when the sun is south of the equator the highest high water is the afternoon tide.

Semporna.—A pier at Semporna extends nearly a quarter of a mile over the shore reef into deep water. There is a wooden building on the head of the pier.

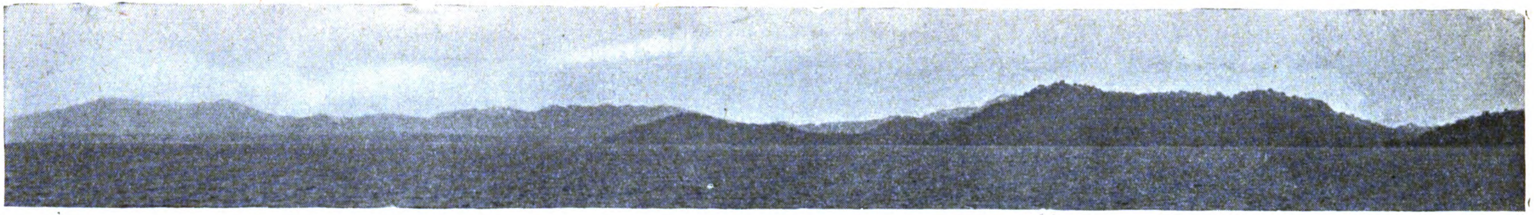
The paramount native Chief, through whom the British government communicates with the natives of the surrounding islands, resides here. There is a block-house garrisoned by police, a Custom house, and a considerable number of natives.

The District Officer from Lahad Datu visits the station periodically.

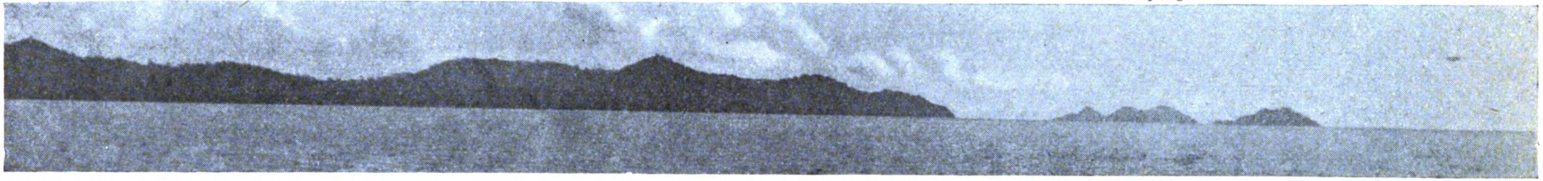
Charts 1680, 1681.

Directions.—Approaching from northward, after passing between Larapan and Sabankat islands, the entrance to Trusan Tando-Bulong will easily be identified by Hood hill lying in line with it, and also by Mount Connor and Lok Bakong hill (*see* view facing page 171); there are no hills on Bum-Bum island. From a position with the centre of Larapan island in line with Tanjong Sidongal, bearing about 345°, and the north-western extremities of Sabankat island and Pulau Gaia in line, bearing about 049°, the opening between the reefs, which extend from either side of the entrance, will be easily distinguished; thence a vessel should steer for the inner end of the pier at Semporna, bearing 177°.

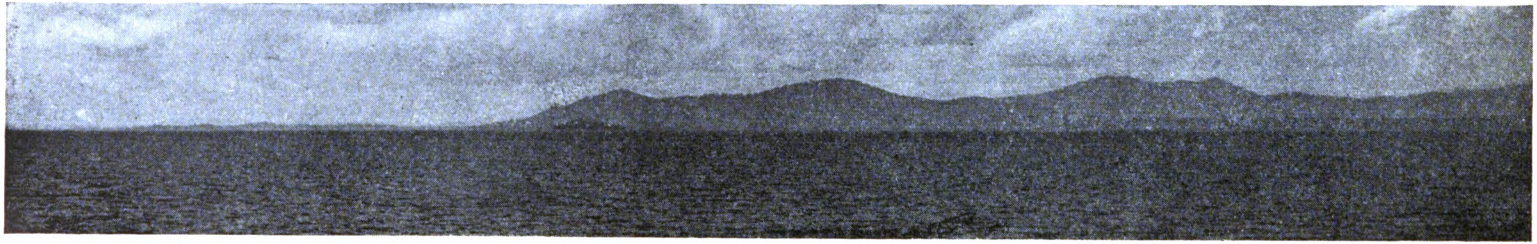
Charts 2576, 2660b, 1263.



South-eastern approach to Trusan Tando Bulong. Western extremity of Tanjong Tutop in line with north-eastern summit of Double hill, bearing 309°.
(*Original dated* 1918.)

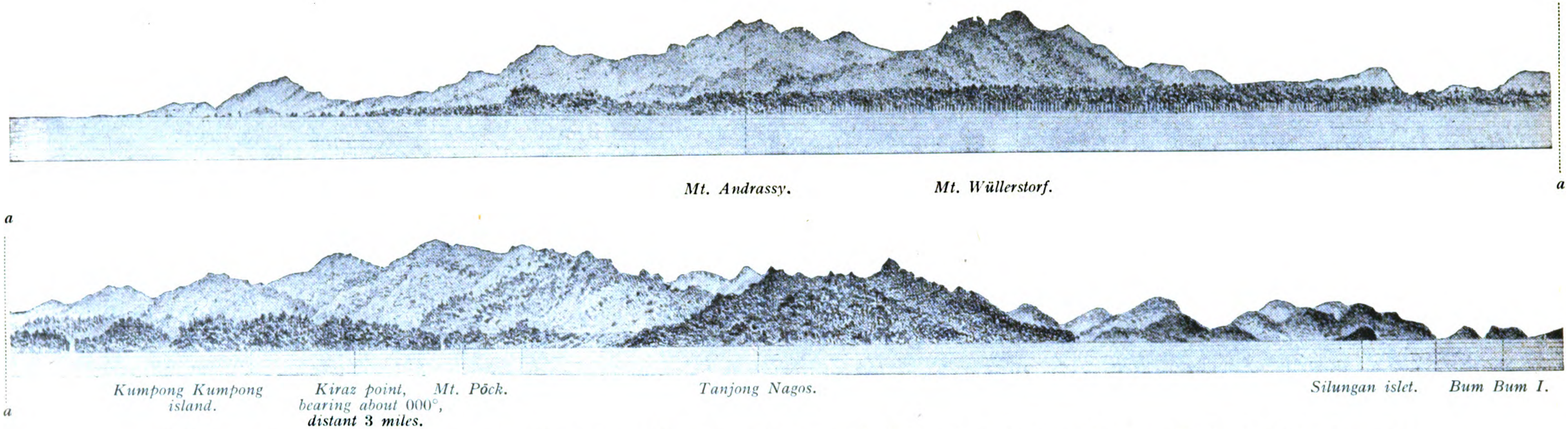


South-western approach to Trusan Tando Bulong. North-western extremity of Manampili islet, distant 7 miles, in line with south-eastern extremity of Nusatonga islet, bearing 066°.
(*Original dated* 1918.)



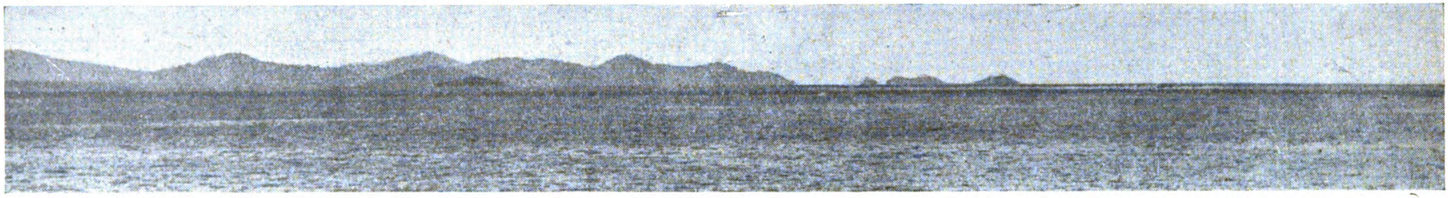
Clearing mark for Ligitan reefs. Northern extremity of Silungan islet in line with the summit (1,076 feet) north-westward of Tanjong Nagos, bearing 291°.
(*Original dated* 1918.)

To face page 175.


Mt. Andrassy.
Mt. Wüllerstorf.
a
a
a
Kumpong Kumpong island.
Kiraz point, bearing about 000°, distant 3 miles.
Mt. Pōck.
Tanjong Nagos.
Silungan islet.
Bum Bum I.

View, in two parts, of the northern shore of Sibuko bay, from Friedrich haven.

(*Original dated* 1876.)


North-western extremity of Silungan islet, distant 10 miles, in line with Mt. Connor, bearing 055°.

South-western approach to Friedrich haven.

(*Original dated* 1918.)

Chart 1681.

This course will lead over the tail of the 5-fathom ($9^{m}1$) bank extending from the eastern entrance point; when the north-western extremity of Bum-Bum island bears 087°, she should keep in mid-channel and pass one cable off the head of the pier at Semporna; thence she should steer for the point on the western side of the channel east-north-eastward of Hood hill, bearing 147°, passing 2 cables south-westward of Daisy islet; on rounding the point she should be guided by the beacons which stand on the edge of the fringing reef on the western side of the channel, and thence steer for Sipangao islet, bearing 217°, which leads about one cable from the edge of the reef off the south-western extremity of Bum-Bum island, and thence the same distance from the reef on the western side which is marked by beacons southward of Hood hill.

The only known dangers outside the reefs on either side in the southern part of Trusan Tando-Bulong are two small coral patches on the eastern side; one patch, marked by two beacons, lies north-westward of Sipangao islet and 2 cables beyond the edge of the reef; the other lies westward of the southern end of Nusatonga islet and 1½ cables beyond the edge of that part of the reef.

A vessel entering the southern end of Trusan Tando-Bulong from Ligitan channel may pass between Gusungan islet (*Lat. 4° 19′ N., Long. 118° 33′ E.*) and the south-western extremity of Creagh reef, which is half a mile wide, by keeping the western extremity of the rocky point forming the western extremity of Tanjong Tutop, in line with the northern summit of Double hill, bearing 309°, which leads midway between the reefs, the edges of which, when the sun is low or ahead, are not easily distinguished. *See* view facing page 174.

A vessel approaching from south-westward should keep the north-western extremity of Manampili in line with the south-eastern extremity of Nusatonga, bearing 066°, which leads north-westward of Gusungan and into the southern entrance to Trusan Tando-Bulong. *See* view facing page 174.

Double hill is a saddle-shaped hill, 760 feet ($231^{m}6$) high, lying on a ridge between the Pöck range, westward of it, which shows on the sky line, and the coastal ridge, and is generally easy to identify from its position and shape.

Friedrich haven.—Beacons.—Friedrich haven lies between the northern shore of Sibuko bay on the north, and Ligitan, Erzherzog, and Friedrich reefs on the south; between the 5-fathom ($9^{m}1$) lines the least width is about one mile between the bank which extends from the northern shore and the western horn of the Ligitan reefs, and the least depth in the fairway is 6 fathoms ($11^{m}0$), mud. The horn of Ligitan reefs can generally be distinguished, and is steep-to.

Between Tanjong Tutop and a point near the entrance to a small river, about 2½ miles westward, the coast is rocky and backed by high hills, thence to Tanjong Nagos, 6¼ miles farther westward, the coast is low and bordered with mangroves. Immediately above Tanjong Nagos there is a wooded range, from 840 to 1,200 feet ($256^{m}0$ to $365^{m}8$) high, and 6¼ miles north-westward of the point is Mount Pöck, 1,860 feet ($566^{m}9$) high, the westernmost peak of a range extending north-eastward, separated from the wooded range southward by a deep valley. Mount Pöck is the summit of the ranges on the eastern side of the valley of the Kumpong river.

Silungan, a wooded islet, 170 feet ($51^{m}8$) high, lies on the southern

Charts 2576, 2660b, 1263.

Chart 1681.

end of a reef, 2½ miles east-south-eastward of Tanjong Nagos and 1½ miles offshore.

Between Tanjong Nagos and a point 5¼ miles westward there is a bay into which the Kumpong river flows; at its mouth is Kumpong Kumpong island, 280 feet ($85^{m}3$) high, and densely wooded. The main entrance to the river is on the eastern side of the island; the narrow channel on the western side nearly dries. There is a small village on the northern side of the island.

There was a depth of not more than 3 or 4 feet ($0^{m}9$ or $1^{m}2$) on the bar of the Kumpong river in 1891, but within the entrance there were depths of from 1½ to 6 fathoms ($2^{m}7$ to $11^{m}0$). On entering, it appears a fine broad river with two branches, joining at 2½ miles from its mouth and enclosing a narrow island.

The river was ascended by the steam cutter of H.M.S. *Egeria*, in 1891, for 8 miles from the mouth, at which point the water was brackish. Further progress was barred by the banks narrowing and by the interlacing of the foliage overhead, but there was still a depth of 2 fathoms ($3^{m}7$). Two branches of the river taking a southerly direction were also explored, both ending similarly in deep narrow creeks.

The mangrove ceases at 4 miles from the mouth; higher up the banks are clothed with nipa palms, with occasionally a red earthy bank appearing on one side and swamp on the other. The river is singularly free from snags or obstructions of any kind. From the topography of the country it must drain a considerable area. There were no signs of inhabitants.

Ligitan reefs are a series of detached reefs with shallow water between them, lying from 3¾ to 7 miles from the northern shore of Friedrich haven. The western reef is marked by a beacon, surmounted by a black globe, situated near its northern extremity. About one mile south-south-eastward of this beacon there is another, also surmounted by a globe, and standing on a large concrete base. The bank on which these reefs lie is very steep-to on its southern side. On the middle reef there are two patches, which dry 4 feet ($1^{m}2$).

The northern extremity of Silungan islet (*Lat. 4° 19′ N., Long. 118° 27′ E.*) in line with the summit of a mountain, 1,076 feet ($328^{m}0$) high, above Tanjong Nagos, bearing 291°, leads northward of Ligitan reefs. *See* view facing page 174.

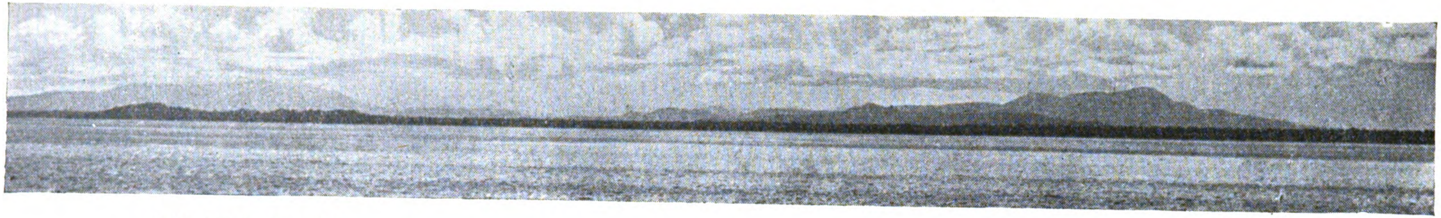
Near the middle of Ligitan reefs there is a break in their continuity 2¼ miles wide, and through the western side of this opening there is a channel which, although not closely examined, appears from the depths to be navigable.

Erzherzog reef is separated from the westernmost of the Ligitan reefs by a deep channel, 6 cables wide; on the northern side of the reef is a sand cay, which dries 6 feet ($1^{m}8$). A small detached reef lies half a mile north-eastward of Erzherzog reef.

Friedrich reef, with a sand cay, which dries 7 feet ($2^{m}1$), on its north-western side, lies 1¾ miles westward of Erzherzog reef, with a clear passage between.

Anchorage. — Directions. — Anchorage may be obtained in Friedrich haven, in a depth of 6 fathoms ($11^{m}0$), mud, with the north-western extremity of Silungan islet in line with Mount Connor, bearing 055°, and the summit of Kumpong Kumpong island, 324°. *See* view facing page 175.

Charts 2576, 2660b, 1263.

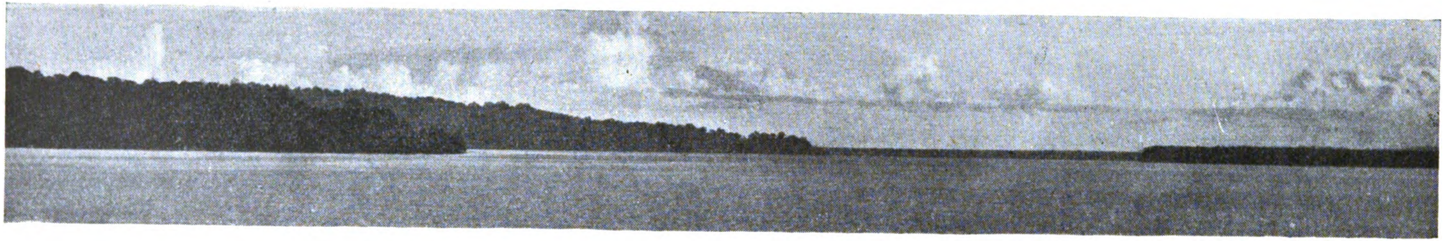


Saddle hill, bearing 322°,
distant 8½ *miles.*

Mt. Wüllerstorf.

Northern shore of Sibuko bay, from south-western approach to Friedrich haven.

(*Original dated* 1918.)



Grassy point.

Agas point,
***bearing about* 230°,**
distant about* 3 *miles.

Northern approach to Coal Mine reach.

(*Original dated* 1918.)

Chart 1681.

A vessel from south-westward should approach the anchorage with the north-western extremity of Silungan islet in line with Mount Connor, bearing 055°, passing between Egeria shoal and Roach reefs and close north-westward of Friedrich reef, the sandbank on which will generally be seen on approaching it. After passing this reef, if bound for Trusan Tando-Bulong or Ligitan channel, she should steer for the summit of Manampili, bearing 067°, which leads in mid-channel between the northern extremity of the westernmost of the Ligitan reefs and the edge of the shoal as defined by the 5-fathom ($9^{m}1$) line extending from the northern shore.

Tidal streams.—The tidal streams run at a rate of three-quarters of a knot.

Coast.—Light.—Between the western entrance point of Kumpong river and the eastern entrance to Balung or Baluk river, about 9 miles westward, the coast is low and bordered with mangroves.

Charts 1681, 2099.

On the eastern side of the entrance to Balung river is Saddle hill (*Lat. 4° 18′ N., Long. 118° 12′ E.*), a ridge, the eastern hump of which is 330 feet ($100^{m}6$) high, and the western, 450 feet ($137^{m}2$) high. *See* view facing this page.

Balung river is about three-quarters of a cable wide at its mouth, increasing to 2 cables within the entrance. It takes its rise between Mount Wüllerstorf and Mount Lucia, and flows in a southerly and easterly direction to the foot of one of the spurs running down from Mount Wüllerstorf, and thence turns southward towards Saddle hill. In 1892 the course of this river was traced by the steam cutter of H.M.S. *Egeria* for 6 miles, or about 4 miles in a direct line from the coast, at which point the river was 90 feet ($27^{m}4$) wide, with a depth of 1½ fathoms ($2^{m}7$), further progress being barred here by a fallen tree. In the lower reaches there is a depth of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$); the mangrove swamp extends to about 1½ miles from the coast; for the remainder of the river's course, as far as it was traced, the banks are lined with nipa palms.

The entrance to the river lies between two banks of sand and mud projecting in a southerly direction from the mouth. In 1892 the bank on the eastern side dried for a considerable distance; that on the western side dried out for about 6½ cables, beyond which it had depths of from 2 to 6 feet ($0^{m}6$ to $1^{m}8$) over it; the narrow channel between the two banks carried a depth of 1½ fathoms ($2^{m}7$).

Chart 2099.

Between the western entrance point of Balung river and Batu Tinagat, about 12 miles west-south-westward, the coast is fronted by a mud flat, which dries for about 3½ cables offshore. A reef, which dries, was reported, in 1926, to lie about 2¾ miles south-south-westward of the western summit of Saddle hill. The bank between this reef and English spit, about 4 miles south-south-westward, was reported, in 1926, to be extending eastward.

English spit is the south-eastern extremity of a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, which extends as much as 5½ miles offshore between the mouth of Balung river and Batu Tinagat.

Apas river flows out on this coast, 5 miles from Batu Tinagat; there is a depth of one foot ($0^{m}3$) on its bar, and, in 1892, a small boat was only able to ascend it for one mile. Batu Tinagat, 15 feet

Chart 2099.

(4^{m}6) high, and bare, is a small mushroom-shaped rock lying off a point formed by a spur of the Batu Tinagat hills.

A shoal of sand and mud, awash, lies from about 1¼ to 1¾ miles offshore between Batu Tinagat and the mouth of Apas river.

A light is exhibited, at an elevation of 325 feet (99^{m}1), from a circular segmental iron tower, 30 feet (9^{m}1) in height, on the southern slope of Mount Putri, about one mile west-north-westward of Batu Tinagat.

Charts 1681, 2099.

Off-lying dangers.—Beacons.—Darby bank, with a least depth of 6 fathoms (11^{m}0), coral, over it, is the outermost danger in the southern approach to Friedrich haven, and lies about 11½ miles southward of Saddle hill. Hand rock, awash, is the most serious danger bordering the approaches to Tawau from eastward ; it lies on a small coral bank on the edge of the 20-fathom (36^{m}6) line, and is situated about 9½ miles southward of Saddle hill. A steel beacon, surmounted by a globe, painted in black, white and red horizontal bands, stands on Hand rock ; it is very difficult to distinguish between the bearings 272° and 002°, on account of the dark background.

Chart 2099.

Kukusan, bearing 300°, kept well open south-westward of Mount Putri, leads south-westward of Hand rock and Darby bank. These dangers are covered by the *red* sector of Mount Putri light (*Lat. 4° 13′ N., Long. 117° 59′ E.*).

Chart 1681.

Alert patches, extending from about 1½ to 4½ miles north-north-eastward of Darby bank, are three coral shoals, with a least depth of 4 fathoms (7^{m}3) on each, and deep channels between.

Although the least depth obtained on Darby bank was 6 fathoms (11^{m}0), and on the Alert patches 4 fathoms (7^{m}3), yet as a matter of prudence it is always inadvisable to cross such shoals in any vessels but those of very light draught.

Charts 1681, 2099.

A rocky shoal, with a least depth of one foot (0^{m}3), sand and coral, and steep-to, lies about 3 miles north-north-eastward of the beacon on Hand rock.

Chart 1681.

Roach reefs are two reefs a quarter of a mile apart, lying just within the 100-fathom (182^{m}9) line, about 9 miles south-eastward of the eastern summit of Saddle hill ; the north-eastern and larger of these reefs dries 3 feet (0^{m}9). About 1½ miles north-eastward of this reef is a coral patch, with a depth of 4 fathoms (7^{m}3) over it.

Egeria shoal is a small coral patch, with a depth of 2 fathoms (3^{m}7) over it, lying on the north-western side of the fairway to Friedrich haven, and with a clear passage 3 miles wide between it and Roach reefs.

A small reef, nearly awash, lies three-quarters of a mile north-north-westward of Egeria shoal.

Charts 1681, 2099.

Heel reef, a small patch of rotten coral and mud, which dries 2 feet (0^{m}6) and is steep-to, lies 4½ miles south-south-eastward of the eastern summit of Saddle hill. It is marked by an iron post, surmounted by a red cylinder.

Chart 1681.

Chance rock, a small coral head, with a depth of 1½ fathoms (2^{m}7)

Chart 1681.

over it, and steep-to, lies on the north-western side of the fairway to Friedrich haven, about midway between Egeria shoal and Friedrich reef.

Lehnert reef, of sand and coral, which dries 2 feet ($0^{m}6$) near its southern end, lies 4 miles south-eastward of the eastern summit of Saddle hill. There is discoloured water southward of the reef. A beacon, surmounted by a black cone, stands on the southern end of the reef.

A narrow reef lies 2 miles south-westward of the southern point of Kumpong Kumpong island, and another reef lies about one mile offshore 4½ miles westward of the same point.

Egeria shoal, Heel reef, Chance rock, and Lehnert reef are all difficult to discern under certain conditions of light, on account of the muddy water in their vicinity.

All the above-mentioned dangers are covered by the *red* sector of Mount Putri light (*Lat. 4° 13′ N., Long. 117° 59′ E.*), bearing less than 297°.

Chart 2099.

Sibetik island.—Boundary beacons.—Dangers.—Sibetik island is separated from the coast of Borneo north-eastward of it by a strait from 3½ to 5 miles wide, but north-westward of the island there is only a channel, half a mile wide, separating it from the Serudong delta. A range of densely wooded hills traverses the island throughout its length, the summit being Mount Antoinette, 1,550 feet ($472^{m}4$) high in the middle. Cornelis peak, 550 feet ($167^{m}6$) high, near the eastern end of the island, is prominent from any direction bearing more than 225°, but is less remarkable from other directions. *See* view facing page 170.

The boundary line between British and Dutch territories on the parallel of 4° 10′ N., passes approximately through the centre of Sibetik island. The position where this line cuts the east coast of the island is marked by a stone beacon on the edge of the mangrove swamp. A boundary stone also marks the spot where the line cuts the south-western coast. A wooden tripod beacon stands on Burs huk, 3¾ miles westward of the latter stone.

Between Steenen huk (Stone point), the south-eastern extremity of Sibetik island, and East point, about 3¾ miles northward, the sandy beach is backed by conspicuous red cliffs, from 20 to 80 feet ($6^{m}1$ to $24^{m}4$) high ; the country inland is low and densely wooded.

North-eastward and eastward of Steenen huk there are several patches of rocks, some of which dry and others with a depth of less than 6 feet ($1^{m}8$) over them. About 1½ miles south-westward of the point and close inshore there is a rock above water.

At East point there is a hard sandy beach backed by high casuarina trees, and a sand and mud flat, which dries, extends 1½ miles eastward from the point ; it is not so soft as the flats of unmixed mud farther northward. About 1¾ miles northward of East point, and one mile offshore, there is a sandbank, which dries 4 feet ($1^{m}2$) ; it is separated from the mud flats fronting the coast by a narrow channel ; the edge of this sandbank is very steep-to, as is also the edge of the shoal extending offshore between the sandbank and Saima point, the north-eastern point of the island ; the depths decrease suddenly from 6 to 2 fathoms ($11^{m}0$ to $3^{m}7$).

Charts 2576, 2660b, 1263.

Chart 2099.

Saima point is low and bordered with mangroves, and is not easily identified. About half a mile northward of the point there is a sandbank, which dries 4 feet ($1^{m}2$), with a depth of 8 fathoms ($14^{m}6$) between. About one cable westward of the sandbank there is a 3¼-fathom ($5^{m}9$) patch.

Off-lying dangers.—Unarang rock, which dries one foot ($0^{m}3$), and is steep-to, lies 10 miles east-south-eastward of Steenen huk, and is the southernmost outer danger in the approach to Tawau; the main channel in the approach lies between this rock and Hand rock (page 178).

Makasser (Mangkassar) banken are two banks, portions of which are awash, and steep-to on both the northern and southern sides; the western bank lies about 4½ miles southward of Steenen huk (*Lat. 4° 04′ N., Long. 117° 56′ E.*). A ridge, with depths of less than 5 fathoms ($9^{m}1$) over it, extends 3½ miles eastward from the eastern extremity of the banks. Depths of 8 fathoms ($14^{m}6$) were reported in 1913, between Unarang rock and Makasser banken.

Padang bank, with a depth of 3 feet ($0^{m}9$) over it, on which the sea breaks, lies about 2 miles south-south-eastward of Steenen huk. The channel between Makasser banken and Padang has depths of from 5 to 7 fathoms ($9^{m}1$ to $12^{m}8$), but as the western part has not been examined it would be imprudent to attempt to pass through it.

A reef of sand and coral, which dries one foot ($0^{m}3$), lies about 1¾ miles south-eastward of Steenen huk.

Dutch spit is the eastern extremity of a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, which extends about 5¾ miles eastward from Steenen huk and the coast northward of it. A detached shoal, with a depth of 2¾ fathoms ($5^{m}0$) over it, lies 1½ miles north-north-westward of the extremity of the spit.

All the above-mentioned dangers are covered by the ***red*** sector of Mount Putri light, bearing more than 329°.

Vessels approaching Tawau from southward should be careful in rounding Dutch spit, especially when the north-west-going stream is running.

Approach to Tawau.—Dangers.—Between the point one mile westward of Batu Tinagat and the entrance to Tawau river, 4¾ miles westward, is a bay, the shore of which consists of mangroves, fringed by mud flats, which dry, extending from about 2½ to 6 cables offshore.

Swirl patch, over which there is a depth of 2¼ fathoms ($4^{m}1$), coral, lies 1½ miles south-westward of Mount Putri lighthouse; it may be discerned by the swirl and eddies over it.

Chart 1781, plan of Tawao.

The coast between the entrance to Tawau river and Tawau is bordered with coconut plantations, and is fringed by a bank of mud and sand which extends from one to 4 cables offshore, and dries from 2 to 4 feet ($0^{m}6$ to $1^{m}2$).

Moysey shoals, with a least charted depth of 4¾ fathoms ($8^{m}7$) over them, lie about 8½ cables south-south-westward of the southern entrance point of Tawau river. In 1922, a depth of 3½ fathoms ($6^{m}4$) was obtained on these shoals.

Harbour shoals comprise several patches, with charted depths of from 3½ to 5 fathoms ($6^{m}4$ to $9^{m}1$) over them, situated between Moysey shoals and Tawau. In 1922, a depth of 2¾ fathoms ($5^{m}0$) was obtained on these shoals.

Charts 2576, 2660b, 1263.

Chart 1781, plan of Tawao.

Wicks rock, awash, lies 3 cables offshore, and 8 cables north-westward of Tawau pier-head.

Pier.—Light.—A pier with a **T**-head, 150 feet ($45^{m}7$) in length, extends south-south-westward from a position about 1¼ cables south-eastward of Tawau point (*Lat. 4° 15′ N., Long. 117° 53′ E.*). In 1935, the depth alongside the western end was 10 feet ($3^{m}0$), and alongside the eastern end 26½ feet ($8^{m}0$). Vessels usually berth alongside. There are two flagstaffs, one on the middle of the pier, and the other at the inner end.

The pier was reported, in 1945, to be badly damaged, but vessels up to 300 feet ($91^{m}4$) in length with a maximum draught of 20 feet ($6^{m}1$) could berth alongside.

A light is exhibited, at an elevation of 40 feet ($12^{m}2$), from a steel framework tower, on the head of the pier at Tawau.

Anchorages.—Anchorage may be obtained, in a depth of 7½ fathoms ($13^{m}7$), mud over hard sand, with the pier-head bearing 124°, distant 6¼ cables, also in a depth of 8½ fathoms ($15^{m}5$), with the pier-head bearing 112°, distant 5 cables.

The quarantine anchorage is about 1¾ cables southward of the pier-head, with the pier flagstaffs in line. If anchoring farther out, the inner flagstaff should be kept well open westward of the outer flagstaff.

Charts 1781, plan of Tawao, 2099.

Tidal streams.—Off Tawau the south-east-going stream commences about half an hour after high water by the shore, and has a maximum rate of 2¾ knots at springs; the north-west-going stream commences three-quarters of an hour after low water by the shore, and attains a maximum rate of 1¾ knots at springs.

Between Balung river and Sibetik island the streams southward of English spit set west-north-westward at a rate of half a knot and east-south-eastward at a rate of three-quarters of a knot; off the eastern end of Sibetik island they set north-westward at a rate of 1¼ knots and south-eastward at 1½ knots.

Tawau.—The settlement of Tawau is situated close south-eastward of Tawau point, on the northern side of the entrance to Cowie bay. There is a Government station here, which is the headquarters of the Resident.

Communication.—Radio station.—There is regular steamer communication with other ports in the State of North Borneo and ports in the Oost-Indische Archipel also with Hong Kong, China, Japan, Manila and Java.

Tawau is connected to the general telephone system.

There is a radio station situated close to the pier. *See* page 14.

Harbour facilities.—Fresh beef and vegetables may be obtained.

Chart 1681.

Directions.—A vessel bound for Tawau from Friedrich haven may use the inner route as the shore marks are comparatively near. From a position about one mile northward of Friedrich reef, the sand cay on which can be identified, the vessel should steer 261°, which leads about 6½ cables southward of the beacon on Lehnert reef, and the same distance northward of the beacon on Heel reef; and when the western summit of Saddle hill bears 345°, she should alter course to 210° and pass about 3½ cables south-eastward of the elbow in the 5-fathom ($9^{m}1$) line off English spit, also about one mile north-westward

Chart 1681.

of the shoal lying 3½ miles south-westward of Heel reef and about 1¼ miles north-westward of the beacon on Hand rock; the two latter dangers should specially be guarded against. Soundings should give ample warning if the south-eastern side of English spit is being too closely approached; if depths of from 7 to 8 fathoms ($12^{m}8$ to $14^{m}6$) are maintained the vessel will ensure passing this spit at a safe distance.

Chart 2099.

On opening Kukusan, bearing 297°, well clear south-westward of Mount Putri, the vessel should steer 287°; care should be taken to bring Kukusan to bear more than 312° by the time Mount Putri is abeam in order to avoid Swirl patch, which danger will be passed when Saddle hill is lost sight of behind Batu Tinagat. When Kukusan bears 357°, and open westward of Tawau point (*Lat. 4° 15′ N., Long. 117° 53′ E.*) the vessel should steer for it on that bearing, which leads to the anchorage westward of Moysey and Harbour shoals, and anchor when the pier-head at Tawau bears 024°.

Chart 1681.

If taking the outer route from Friedrich haven, the vessel should keep the northern extremity of Silungan islet in line astern with Mount Connor, bearing 055°, which leads south-eastward of Chance rock and Egeria shoal, and between Alert patches and Hand rock, passing three-quarters of a mile south-eastward of the beacon on the latter; in clear weather no difficulty will be experienced in fixing the vessel's position by cross bearings.

Chart 2099.

Cowie bay.—Cowie bay is the name given to an extensive sheet of water lying westward of Tawau and Saima point; at its head is a shallow delta intersected by a labyrinth of creeks, the shores of which are everywhere lined with mangroves, and into which many rivers flow, the principal being the Kalabakang. The bay has been surveyed as far as the limits of navigation, 12 miles beyond Tawau, above which the bay becomes blocked across its entire breadth by numerous mud flats, between which are intricate channels leading to the various rivers. Both shores of the bay consist of low mangroves fronted by extensive mud flats, and present no distinguishing features. The depths in Cowie bay are everywhere regular, the bottom being soft mud.

There are deep channels leading to some of the rivers at the head of the bay, but they have not been properly examined.

The northern shore of the bay is intersected by numerous small creeks and rivers, the principal of which is the Merotai, which discharges on the western side of Heherr point, situated about 5½ miles north-westward of Tawau pier; it can be ascended by launches for about 3 miles at high water. Vessels can load timber at the anchorage off the mouth of the river. Morrell bluff, which is conspicuous, lies about 2½ miles north-north-westward of Tawau.

On the southern shore there is a shallow bight between Saima point and Prescott point, 7 miles north-westward.

Charts 306, 2099.

Grassy point, about 6¼ miles westward of Prescott point, is somewhat noticeable, being the only hard ground on the northern side of Sibetik island, and appears as a grassy opening of flat land fronted by clay cliffs, 30 feet ($9^{m}1$) high. The coast for about 2 miles eastward of

Charts 2576, 2660b, 1263.

Charts 306, 2099.

Grassy point is fringed by a bank, with depths of from 3 feet to 1½ fathoms (0^{m}9 to 2^{m}7) over it, extending from one to 6½ cables offshore; thence the northern part of the bank forms a spit, with depths of from one to 1¾ fathoms (1^{m}8 to 3^{m}2) over it, extending about three-quarters of a mile farther eastward.

Chart 2099.

Kalabakang river, flowing into Cowie bay, was, in 1892, explored, together with the principal creek near its entrance, by the steam cutters of H.M.S. *Egeria* for a distance of 22 miles following the course of the river, or 9 miles in a direct line from the mouth.

The mangrove swamp extends for 3 miles from the coast; higher up the banks are lined by nipa palms; the river, which varied in width from 90 to 120 feet (27^{m}4 to 36^{m}6) and with depths of from 2 to 5 fathoms (3^{m}7 to 9^{m}1), made very sharp bends in places. At 6 miles in a direct line from the entrance the banks on both sides became higher with hard ground, and there were native huts with partially cleared land in their neighbourhood. The river here began to wind about considerably, and in several places the depth decreased to one fathom (1^{m}8).

At the farthest point reached by the boats the river was about 90 feet (27^{m}4) wide, but a line of rapids right across barred further progress. Here the water was fresh.

The rate of the current was about half a knot.

Chart 306.

HEAD AND SOUTHERN SIDE OF SIBUKO BAY.—Coal Mine reach.—Dangers.—The northern entrance to Coal Mine reach lies between Grassy point (*Lat. 4° 16′ N., Long. 117° 41′ E.*) and Adolphy point, the northern entrance point of Simatahan river, about one mile north-westward. Coal Mine reach, which extends south-westward between the north-western side of Sibetik island and Traverse island, has a least width of 5¾ cables. Simatahan and Serudong rivers flow into the north-eastern and south-western ends, respectively, of the reach. *See* view facing page 177.

Pilot bank, with charted depths of less than 3 fathoms (5^{m}5) over its outer end, extends about 3¾ miles east-north-eastward from Adolphy point; both this bank and that extending from Grassy point are steep-to. Sounding gives little warning, especially between the two points, where the navigable channel is only half a mile wide.

Llewellyn bank is an extensive mud flat, which dries in patches, and extends from the eastern end of Traverse island between Griffith and Agas points, on the southern side of the entrance to Simatahan river towards Adolphy point, leaving a passage between its northern edge, which is steep-to, and the point only 1½ cables wide.

The shoals in the vicinity of Grassy, Adolphy, and Agas points vary considerably during the year owing to silt brought down by heavy rains and subsequent attrition by the tidal streams.

Drake bank, of hard clay, with a least charted depth of 3½ fathoms (6^{m}4) over it, lies in mid-channel near the south-western end of Coal Mine reach. In 1922, the least depth obtained on the bank was 29 feet (8^{m}8).

There is a disused coal depôt and pier on the south-eastern shore of Coal Mine reach, 3 miles south-westward of Grassy point.

Chart 306.

Tidal streams.—In Coal Mine reach the out-going stream commences one hour after high water by the shore and attains a maximum rate of 2½ knots at springs at half tide. The in-going stream commences 1¼ hours after low water by the shore and attains a maximum rate of 2¾ knots at springs. Both streams, however, at times, run at a rate of 3½ knots off Grassy point and off the disused pier.

Charts 306, 2099.

Anchorage. — Directions. — Vessels may obtain anchorage 4 cables northward of the disused pier and about 2¼ cables from the south-eastern shore, in a depth of 7 fathoms (12^{m}8). Small vessels may anchor nearer the pier.

From the anchorage off Tawau a vessel should steer about 285° for a distance of about 9½ miles, passing along the northern shore of Sibetik island, westward of Prescott point, about one mile distant. This course leads across the tidal streams, and attention is necessary. When Adolphy point, which appears as a somewhat sharp tangent of land, bears 262°, she should steer for it on that bearing, which leads between the dangers on either side.

When Datum point (*Lat. 4° 14′ N., Long. 117° 38′ E.*), the extremity of the land on Sibetik island south-westward of Grassy point, is seen open of Grassy point, bearing 224°, she should steer for it on that bearing, and alter course immediately as the channel is only half a mile wide, passing 3 cables off the land at Grassy point, after which she should steer a mid-channel course to the anchorage.

Chart 306.

Simatahan river.—Simatahan river extends for 7 miles in a general west-north-westerly direction to Caution point at the northern end of Trusan Merlin, beyond which it unites with the waters of Kalabakang river. The shores are bordered with mangrove and are generally steep-to. No difficulty will be experienced in proceeding as far as Rendezvous point, on the northern shore, about 6¼ miles above Adolphy point, there being a least depth of 5½ fathoms (10^{m}1) in the fairway, and the tidal streams do not exceed a rate of one knot. Guide bank fringes the south-western shore for a distance of about 4½ cables to about one cable south-eastward of Caution point, and narrows the navigable width of the river.

Directions.—Anchorages.—To enter the river a vessel should steer for the extremity of the land on the southern bank, about half a mile westward of Griffith point, bearing 290°, in order to pass Adolphy point at a distance of 1½ cables, and which leads midway between the dangers on either side. On approaching Adolphy point the eye is the principal guide. The out-going stream at springs sets somewhat sharply round Adolphy point and over Pilot bank. After passing Adolphy point she should alter course northward as Griffith point is approached, in order to gain a mid-channel course, which should be preserved from here onwards. A vessel of moderate size will find barely sufficient room to swing if moored in the centre of Long Reach, where the river banks are about 1¾ cables apart, in a depth of 10 fathoms (18^{m}3). In 1910 H.M.S. *Merlin* lay at single anchor in mid-channel, about a quarter of a mile south-eastward of Caution point.

Serudong river.—Serudong river is entered between Doris point, the southern extremity of Traverse island, and Monk point, three-quarters of a mile south-south-westward; at Merlin point, on the

Charts 2576, 2660b, 1263.

southern shore, about 6½ miles above Monk point, the river is known as the Silimpopon ; the river at Merlin point is only 1¼ cables wide, and vessels of any size should not proceed above it. At Dingle point, on the south-western shore, about 2 miles above Merlin point, the river is only one cable wide ; thence it narrows rapidly, and is blocked by a flat, over which there was, in 1910, a depth of 6 feet ($1^{m}8$). About 1½ miles above Dingle point rising ground commences on the left bank, and from here to 1½ miles farther, the river is very narrow and tortuous and can only be ascended by launches at half-tide ; 1¾ miles beyond this point launches and lighters do not ascend and about 2 miles farther up is the tidal limit of the river.

The navigation of the river presents no difficulty as far as Merlin point, and the tidal streams seldom exceed a rate of one knot. There is a least depth of 4 fathoms ($7^{m}3$) on Entry flat, between Doris and Monk points, and 4½ fathoms ($8^{m}2$) on Watson ridge, about one mile below Merlin point (*Lat. 4° 15′ N., Long. 117° 31′ E.*). The shores are bordered with mangrove and are generally steep-to.

Directions.—Anchorages.—On entering Serudong river from Coal Mine reach, the vessel should round Doris point at a distance of 2 cables, to avoid Duke bank, which extends 6 cables east-north-eastward from Monk point with depths of less than 3 fathoms ($5^{m}5$) over it. The tangent of the land on the north-eastern side of Harvey reach in line with Junction point, 3½ miles north-westward of Monk point, bearing 301°, leads about three-quarters of a cable north-eastward of Duke bank as defined by the 3-fathom ($5^{m}5$) line. When Doris point comes in line with Agas point, bearing about 054°, the vessel will have passed Duke bank and should alter course westward and keep in mid-channel. A moderate-sized vessel should not proceed beyond Junction point, where swinging room will be found if moored in a depth of 9 fathoms ($16^{m}5$), eastward of the point. In 1910, H.M.S. *Merlin* lay at single anchor in mid-channel about 2 cables north-westward of Merlin point, where sufficient swinging room was found.

Trusan Merlin.—Trusan Merlin is a narrow sinuous channel connecting Simatahan and Serudong rivers, on the western side of Traverse island. It has a least width of three-quarters of a cable, and a least depth of 5¼ fathoms ($9^{m}6$) in the fairway near the southern end. Clarke creek, entered from the western side of Trusan Merlin between Carroll point, situated about half a mile south-westward of Caution point (page 184), and Frenzel point, is suitable only for launches ; about 1½ miles from its entrance there is firm ground which rises to an elevation of 1,100 feet ($335^{m}3$), the country everywhere being densely wooded.

The navigation of Trusan Merlin presents no difficulties in a handy vessel, but there is scarcely room for vessels to pass if meeting and unprepared.

The rate of the tidal streams, which enter from both ends, does not exceed one knot.

Directions.—If entering Simatahan river from Trusan Merlin, Caution point should be passed at a distance of about 75 yards ($68^{m}6$), as a bank extends some distance from the opposite shore.

If coming from northward, after passing the narrowest part of Trusan Merlin, at Herald point, about 2½ miles below Caution point, care should be taken not to mistake the entrance to Deceive

Chart 306.

creek, about 4½ cables south-eastward of Herald point, for the main channel.

Chart 2099.

South-eastern approach to Serudong and Sibuku rivers.—Light.—The approach to Serudong river from south-eastward is between the south-western side of Sibetik island and Oost Nunukan. The south-eastern end of the channel between these islands should be approached with Deli berg, a conspicuous hill, 827 feet ($252^{m}0$) high, situated on the south-western side of Sibetik island, about 2½ miles southward of Mount Antoinette, in line with the southern point of Sibetik island; this leads south-westward of Makasser banken. Care should be taken when passing it during the in-going stream, which sets directly on to the south-eastern side of Sibetik island.

Oost Nunukan is 876 feet ($267^{m}0$) high near its south-eastern side and densely wooded. Close westward of the northern extremity of the island on a small sandy beach, is a rock above water; about 1¼ miles south-westward of this rock and close offshore are two rocks, awash, and half a mile farther south-westward is a sunken rock.

Two piers, one of which is 525 feet ($160^{m}0$) long, with a least depth of 8 feet ($2^{m}4$) alongside, are situated westward of the northern extremity of Oost Nunukan; there are some buildings in the vicinity.

A light (*Lat. 4° 09′ N., Long. 117° 39′ E.*) is exhibited from the head of the western pier.

Good anchorage may be obtained about 2 cables westward of the western pier and about 1½ cables offshore. The flood stream at the anchorage sets south-westward and the ebb stream north-eastward.

A pilot for Oost Nunukan may be obtained by radio through the harbour master at Tarakan, 24 hours before the arrival at the outer buoy of the swept channel in the approach to Tarakan, where the pilot will board the vessel.

The channel between the northern end of Oost Nunukan and the mouth of Serudong river is intricate and lies between shallow flats which stretch across from one side to the other. In 1914, there was reported to be a least depth of 2 fathoms ($3^{m}7$) in this channel. Abreast Sedam or Haaienbieh island the channel is only 1½ cables wide.

Between the north-western side of Oost Nunukan and Tina Basan is a channel 2 miles wide, with a depth of 2 fathoms ($3^{m}7$) at the southern end. Tina Basan is separated from the coast of Borneo by Trusan Tina Basan, about 3½ cables wide, with a depth of one fathom ($1^{m}8$) at its northern end. At the north-western end of the island, the south-eastern extremity of which is Burs huk, the two branches of Sino Solan river unite, and thence flow northward under the name of Tamba river into Serudong river, about 5½ miles above Monk point.

Chart 2576.

The approach to the entrance of Sibuku rivier lies between Oost Nunukan on the north, and three islands on the south, and is from 2 to 5 miles wide between the banks. On the outer bar, northward of Pulau Ahus, the outer island, there is a depth of 5 fathoms ($9^{m}1$) in the fairway, increasing to 6 fathoms ($11^{m}0$) within, until about 5 miles from the entrance to the Sibuku rivier, where it decreases to 5 fathoms ($9^{m}1$) in mid-channel.

Chart 2099.

Sibuku rivier.—In the entrance to Sibuku (Sibuko) rivier is

Chart 2099.

Senelak, an island, 344 feet (104^{m}8) high at its south-western end, situated 6 miles west-south-westward of the western extremity of Oost Nunukan ; a bank extends from the south-western and western sides of the island. Sikapal and Pelanduk are steep-to wooded rocks lying about three-quarters of a mile north-eastward and close southward, respectively, of Tanjong Tidung Salang, the north-western entrance point of the river ; Tembalan, a similar rock, lies close southward of Senelak.

Anchorage may be obtained by vessels with local knowledge, in a depth of 6½ fathoms (11^{m}9), off the entrance to Itai rivier, about 3 miles south-westward of Senelak island. At spring tides the tidal stream has a rate of 4 knots at this anchorage. As there are eddies which cause a vessel to swing constantly there is a danger of a vessel dragging towards the banks extending from Senelak island.

A bore, which occurs from about 3 days before to 3 days after spring tides, takes place above the village of Pangeran Anam, 32 miles above Senelak ; the advance of the wave, which is about 3 feet (0^{m}9) in height, is rapid, and generally does considerable damage to local craft. The in-going and out-going streams run at a rate of 3½ knots at springs.

The village of Sibuku is situated about 46 miles from the entrance, and is accessible to small motor launches with local knowledge.

Chart 2576.

Itai and Ahus rivieren connect with one another between the north-western end of Pulau Ahus and the south-eastern side of Bukat ; the Itai thence flows westward and north-westward and connects with Sibuku rivier, about 3¼ miles above Senelak (*Lat. 4° 04′ N., Long. 117° 30′ E.*). At the junction of the Itai and Ahus, which is named Muara Bukat, there is a shallow bar, but it is clear of rocks. The land in the vicinity of these rivers is swampy and wooded.

Chart 2099.

Simengaris and Sibakies rivieren flow into a common mouth, about 2½ miles wide, on the northern and southern sides, respectively, of Tanjong Bakies, situated about 4 miles west-north-westward of Tanjong Tidung Salang. Neither river is of any importance, and each becomes very narrow about 6 miles above Tanjong Bakies. Small craft with local knowledge can ascend the Simengaris 14 miles from the mouth, to the village of the same name ; this is the only village on its banks.

Chart 3577.

Coast.—Tanjong Ahus, the south-eastern point of Pulau Ahus, and the adjacent land are monotonously wooded, although the trees on this point are higher than those around. Except for the Sembakung heuvels (chart 2636) on Pulau Mandul, situated about 16 miles west-south-westward of Tanjong Ahus, the land is low.

Sungei Sembakung, which is navigable by vessels with local knowledge, flows out between Tanjong Ahus and Huk Keerweer (Kerweer), 5 miles southward, after running along the northern side of Pulau Mandul ; the better entrance to it, however, is along the western side of Mandul, through Muara Ledung and Trusan Gelagan, which can be entered from the Sesajap delta. The depths in the river as far as Tagol village, about 45 miles above Tanjong Bimau, the western extremity of Mandul, vary between 8 and 10 feet (2^{m}4 and 3^{m}0).

Charts 2660b, 1263.

Chart 3577.

For the coast of Borneo southward of Tanjong Ahus, *see* Eastern Archipelago Pilot, Vol. II.

Chart 2576.

Off-lying dangers.—Light-buoy.—A sunken rock, the existence of which is doubtful, is charted 19½ miles south-eastward of Steenen huk, Sibetik island. A strong swirl was observed, in 1921, in the position assigned to this rock, and natives who frequent this locality in their boats say that the rock exists.

Chart 3577.

Banda reef is of coral, with a depth of 6 feet (1^{m}8) over it, situated 11 miles east-north-eastward of Tanjong Ahus (*Lat. 3° 48′ N., Long. 117° 50′ E.*).

A light-buoy, painted black and exhibiting a *white flashing* light of *five seconds'* duration *every twelve seconds*, is moored about two cables eastward of Banda reef. It was reported, in 1947, to be missing.

Charts 2636, 2660b, 1263.

CHAPTER VI

SULU ARCHIPELAGO

Chart 928.

SULU ARCHIPELAGO.—The Sulu archipelago consists of a chain of islands extending for a distance of about 220 miles from Alice channel, off the north-east coast of Borneo, to Basilan strait, southward of Mindanao, and comprises more than 300 islands of various sizes. It is divided into three principal groups:—Tawi Tawi group, at the south-western end, Jolo group in the centre, and Basilan group at the north-eastern end. Besides these, there are several smaller groups, the description of which is included in that of the three larger groups. *See* also page 4.

Climate and weather.—*See* page 16.

Chart 1868.

Pearl bank.—**Light.**—Pearl bank is an extensive shoal of coral atoll formation, situated about 12 miles east-north-eastward of Talantam bank (page 144). The greater part of the bank covers at some state of the tide, but shoals, which dry, define the outer limits. The northern and southern sides are steep-to. Along the eastern, south-eastern and southern sides is a chain of low coral islands, about a quarter of a mile off which, on the southern side, is a narrow coral barrier reef, from 2 to 3 feet ($0^{m}6$ to $0^{m}9$) high. The islands are wooded with trees, from about 35 to 60 feet ($10^{m}7$ to $18^{m}3$) high. The most prominent are Zau and Lahangan islands on the eastern side of the bank, and Taja island on the western side. The interior of the bank consists of coral shoals and lagoons, with depths of from one foot to 3 fathoms ($0^{m}3$ to $5^{m}5$), or less over it. There is an entrance, which may be used by small craft with local knowledge, situated about 1¼ miles north-north-westward of Sicalangcalong (Sikalangkalong) island, which lies near the southern extremity of the bank.

A detached shoal, with a least depth of 1½ fathoms ($2^{m}7$) over it, lies about 1½ miles south-westward or Taja island.

A light is exhibited, at an elevation of 62 feet ($18^{m}9$), from a white circular framework tower, at the north-eastern end of Zau island (*Lat. 5° 50′ N., Long. 119° 44′ E.*).

Anchorages.—Anchorage may be obtained on the banks north-eastward, south-eastward and westward of Pearl bank.

Tidal streams.—Between Pearl bank and Doc Can (Dok Kan) island, the streams set north-north-westward, and south-south-east-

Charts 2576, 943, 1263.

Chart 1868.

ward and may attain a rate of 6 knots. Northward of Pearl bank the south-east-going stream divides, one part flowing eastward of the bank, and the other part westward of it. Tide-rips occur in the channel between Pearl bank and Doc Can island; they are specially heavy at the edge of the shoal extending north-westward from Doc Can island.

Off the western side of Doc Can island the streams follow the general direction of the 20-fathom ($36^{m}6$) line. About 4 miles south-westward of the island the stream entering Sulu sea was observed to set north-west; due west of the island it set north; and north of the island north-eastward. The streams from the Sulu sea take the reverse directions approximately. Inside the 100-fathom ($182^{m}9$) line southward of Doc Can island it was observed to set east-south-eastward.

Charts 1868, 928.

Doc Can island to Pangutarang passage.—Doc Can island, which has a noticeable cone-shaped tree, about 60 feet ($18^{m}3$) in height, near the western end, lies 11½ miles east-north-eastward of Pearl bank lighthouse. In the western half of the island there is a large lagoon, to which there is an entrance, which dries, between the barrier reefs at about the middle of the southern side of the island. The interior of the eastern half consists of scattered salt ponds and mangrove. The eastern half of the southern side of the island is fringed by a coral barrier reef, from 2 to 5 feet ($0^{m}6$ to $1^{m}5$) high. Coral reefs extend from one to 2½ cables from the high-water line on the northern and eastern sides of the island. There are a few short stretches of beach on the north-western side.

A shoal, with a least depth of 3½ fathoms ($6^{m}4$) over it, lies one mile north-westward of the western extremity of the island.

Laparan island, separated from the eastern side of Doc Can island (*Lat. 5° 53′ N., Long. 119° 57′ E.*) by a navigable channel about a quarter of a mile wide, is a large coral atoll reef overgrown with trees, from about 30 to 50 feet ($9^{m}1$ to $15^{m}2$) in height. A narrow coral reef, from 2 to 3 feet ($0^{m}6$ to $0^{m}9$) high, and continuous except for one break, lies from half to three-quarters of a cable from the mangrove on the southern and south-eastern sides of the island. On the eastern, northern and western sides coral reefs, which dry, extend from half a cable to 3 cables offshore. About 1½ cables off the north-western side is a detached clump of mangrove on the reef, appearing as an island.

The middle of the island consists of an extensive lagoon encumbered with shoals and scattered clumps of mangrove. Small boats may pass over the reefs at high water either at the eastern or western sides of the lagoon, preferably at the eastern side.

The channel between Doc Can and Laparan islands is not recommended for other than small vessels, as the tidal streams in it are strong and tide-rips occur.

Chart 928.

Deatobato island is a low wooded island, with trees from 35 to 50 feet ($10^{m}7$ to $15^{m}2$) high, situated about 3 miles eastward of Laparan island; a large part of the interior of the island is submerged at high water. The coast is fringed by a coral and sand beach, from which, on the western, northern, and north-eastern sides, coral reefs extend from a quarter to 1½ cables from the high-water line.

Charts 2576, 943, 1263.

Chart 928.

A spit, with depths of from 6 to 22 feet ($1^{m}8$ to $6^{m}7$) over it, extends 3 miles north-north-westward from Deatobato island, and a shoal with a depth of 19 feet ($5^{m}8$) over it, lies about 3¾ cables southward of the island. Vessels should give the southern end of the island a berth of at least three-quarters of a mile. Midway between the northern end of the spit and the reef off the eastern side of Laparan island is a shoal, with a least depth of 5¼ fathoms ($9^{m}6$) over it.

Cap island is a low island of coral atoll formation, with trees, from about 35 to 50 feet ($10^{m}7$ to $15^{m}2$) in height, situated about 6 miles east-north-eastward of Laparan island. The coast line, except for short stretches of sand, and coral beaches at the northern and southern ends of the island, consist of mangrove covered at high water, with coral reefs extending from half a cable to 1½ cables offshore.

An extensive lagoon occupies a large part of the interior of Cap island ; there are two shallow entrances to this lagoon, both on the eastern side of the island.

A shoal, with a depth of 34 feet ($10^{m}4$) over it, lies 2½ miles westward of the northern extremity of Cap island.

Deep draught vessels passing between Laparan, Deatobato and Cap islands should keep about one mile from the western side of the latter.

Sail rock, 67 feet ($20^{m}4$) high, lies about 5½ miles eastward of Cap island. From a distance it has the appearance of a sailing vessel, and is an excellent mark. A rock, awash, lies about 1½ cables south-westward, and a rock, with a depth of 5 feet ($1^{m}5$) over it, lies about 1¼ cables eastward of Sail rock.

About midway between Sail rock and Cap island is a shoal, with a depth of 33 feet ($10^{m}1$) over it. Two shoals, each with a depth of 34 feet ($10^{m}4$) over it, lie about 2 miles southward and 1½ miles eastward, respectively, of Sail rock.

Datubato, Tubalubac (Tubalubak), Basbas, Malicut (Malikut), and Cunilan (Kunilan) islands lie on the bank extending about 20 miles south-westward from the south-western side of Pangutarang passage. Their positions can be best seen on the chart. They are all low, though several of them have distinctive trees and coconut groves on them. There are several shoals on the bank, but as only vessels with local knowledge should attempt to cross it, a description of the outer dangers only will be given.

Tablas shoal (*Lat. 5° 54′ N., Long. 120° 20′ E.*), over which there is a least depth of 19 feet ($5^{m}8$), sand and coral, lies about 2¼ miles eastward of the southernmost of the Datubato islands. There is a sand bottom which can generally be seen, and the southern side of the shoal is very steep-to.

Apo Lambu reef, with a least depth of 7 feet ($2^{m}1$) over it, lies about 2¾ miles eastward of Tubalubac island.

A shoal, with a depth of 22 feet ($6^{m}7$) over it, lies about 2¼ miles east-north-eastward of Basbas island.

A bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends 1½ miles north-westward from Malicut island.

Tidal streams.—Amongst the islands between Pearl bank and Pangutarang passage the tidal streams take various directions, their general direction, where unobstructed, being north-north-west and south-south-east.

Charts 2576, 943, 1263.

Chart 928.

For a description of the tidal streams between Pearl bank and Doc Can island, *see* page 189.

Between Pearl bank and Cap island slack water usually occurs from one hour before to one hour after local high or low water, but this varies occasionally from two to three hours either way. Moderate tide-rips may be expected in bad weather and strong tidal streams at the edges of all banks. Tide-rips have been observed off the western side of Cap island, and southward and westward of Deatobato island.

The tidal streams over the extensive bank extending south-westward from Pangutarang passage are strong, setting north-west and south-east, but both direction and rate are modified by the numerous shoals in this area. In the vicinity of Sail rock the streams set about north and south at a rate of from 3 to 4 knots, and change their direction at about the time of high and low water, and even during the period of diurnal tides frequently turn twice daily.

Anchorages. — Directions. — Anchorage, depending on the direction of the wind and sea, may be obtained over the various banks adjacent to the group of islands described above. There are no typhoon anchorages, but the following are recommended in addition to those mentioned off Pearl bank on page 189. Off the southern and north-western sides of Doc Can island ; off the eastern and north-eastern sides of Deatobato island ; and off the eastern side of Cap island.

The tidal streams are too strong or insufficient protection is obtainable for anchoring off the eastern side of Laparan island, or off the western sides of Deatobato and Cap islands.

When approaching, the islands of the group described above will be sighted at a distance of about 10 or 12 miles. Pearl bank may be identified by the long chain of islands along its south-eastern edge, except when approached from the north-east or south-west, and by the lighthouse. Vessels should approach with caution and pass eastward of the bank unless the visibility is such that the position can be frequently checked, as the tidal streams are strong and irregular in this vicinity.

Islands and dangers northward of the Tawitawi group.— Between the group of islands just described and the Tawitawi islands, about 25 miles southward, there is a group of nine islands and numerous dangers, which extend from Bambannan island (*Lat. 5° 37′ N., Long. 120° 17′ E.*), situated about 16 miles southward of Datubato island, to Dammai island, about 12 miles north-eastward of Bambannan. They are of coral atoll formation, from 5 to 6 feet ($1^{m}5$ to $1^{m}8$) high, and densely wooded, the trees being from 60 to 100 feet ($18^{m}3$ to $30^{m}5$) in height. The southern sides of these islands, with the exception of Bilangan island, are fringed with steep coral or coral sand beaches which afford good landing places for boats ; the other sides of the islands are fringed with mangrove and strewn with rocks or bounded by coral barrier reefs. Bambannan, South Lahatlahat, Walan, and Dasaan islands are inhabited.

Between the islands of the group there are numerous shoals, with depths of 5 fathoms ($9^{m}1$) and less, the positions of which can best be seen on the chart. In favourable weather they may be discerned by discoloured water, but little reliance should be placed on this for navigational purposes. The bottom consists of coral, rock, and sand.

Charts 2576, 943, 1263.

Chart 928.

Bilangan island, the westernmost of the group, has a single tree, about 130 feet ($39^{m}6$) in height, standing out prominently above the others. The eastern and northern sides are fringed by coral reefs which extend from half a cable to one cable offshore; the western side is bordered mostly by mangrove to the water's edge.

About one mile westward of Bilangan island there is a coral reef, part of which is always above water; between the reef and the island there is a channel, with a least depth of 8 fathoms ($14^{m}6$).

On Walan island, about 4½ miles east-north-eastward of Bilangan island, there are only a few scattered tall trees. A shoal, with a depth of less than 6 feet ($1^{m}8$) over it, lies 2 miles north-westward of the island.

Mamanuc (Mamanuk) island lies about 4½ miles north-eastward of Bambannan island. Singaan island, about one mile south-south-westward of Dammai island, the northernmost of the group, is fringed by a coral reef which extends from half to one cable off the mangrove. The reefs off the eastern side of the island do not cover at high water, but those off the western side cover at some state of the tide. There is a clear channel between Singaan and Dammai islands, with a least depth of 7 fathoms ($12^{m}8$), but between Singaan and Dasaan islands there is foul ground, part of which dries.

In the interior of Dammai island there is an extensive shallow lagoon bounded by mangrove swamps. Small boats with local knowledge may enter at high water through the entrance on the north-eastern side of the island. A reef extends about a quarter of a mile from the northern end of the island, and reefs and rocks extend about one cable from the eastern side.

Anchorages.—In moderate weather anchorage may be obtained by vessels with local knowledge off Bambannan and Bilangan islands, and off the north-eastern or south-western sides of Dammai island, over a bottom of coral or coral sand, with occasional coral rocks. No anchorage amongst this group can be recommended in heavy weather, as only partial protection can be obtained close offshore.

Tidal streams.—The tidal streams set in various directions near the islands and shoals of this group, but in the unobstructed areas the streams set north-north-westward, and south-south-eastward; the rate seldom exceeds 2 knots. Slack water generally occurs about one hour after high and low water.

Pangutarang passage. — Light. — Pangutarang passage lies between North Ubian island (*Lat. 6° 09′ N., Long. 120° 26′ E.*), situated 21 miles north-eastward of Cap island, Ticul (Tikul) and Usada islands on the south, and Pangutarang and Panducan (Pandukan) islands on the north. It is about 5 miles wide and has considerable depths. The tidal streams run fair with the channel, and attain a maximum rate of 4 knots. The passage is generally used by vessels plying between Jolo (Holo) and Sandakan. Although the islands bordering the passage are low, characteristic clumps of trees form excellent landmarks.

North Ubian island is fringed by a coral reef extending from a mangrove coast, except two short stretches on the northern side. A shallow lagoon, on the shores of which there is a small settlement, is entered from the eastern side of the island by two channels, in each of which there is a depth of about 3 feet ($0^{m}9$), but they are encumbered by growing coral. There is a larger village on the south-western side of the island.

Charts 2576, 943, 1263.

Chart 928.

Ticul island lies one mile eastward of North Ubian island, with a clear and deep channel between them; the tops of the trees are 110 feet ($33^{m}5$) in height.

Usada island, 3 miles eastward of Ticul island, is fringed with coral; the greater part of the island consists of mangrove, only a narrow strip on the eastern side being solid land, behind which are mangrove swamps.

A shoal, with a depth of 28 feet ($8^{m}5$) over it, lies 1½ miles north-westward of the northern extremity of Usada island; it is the only off-lying danger in Pangutarang passage.

Pangutarang island, the largest of the Pangutarang group, is about 20 feet ($6^{m}1$) high and densely wooded. The northern side and parts of the eastern side of the island are fringed by coral, which extends at the northern end, two cables offshore, and is generally steep-to. The beach is sandy with some coral rocks, backed by low coral cliffs. There is one long stretch of mangrove on the eastern side of the island. The island is inhabited and there are numerous patches of coconut and cultivated areas near the coast.

Panducan island, about 2½ miles eastward of the southern part of Pangutarang island, is densely wooded. The northern half consists of mangrove bordered by a coral reef which extends half a mile from the northern extremity.

A light is exhibited, at an elevation of 35 feet ($10^{m}7$), from a white concrete beacon, at the north-eastern point of North Ubian island.

Islands and dangers north-eastward of Pangutarang island.—Kulassein island, about 4 miles east-north-eastward of the northern extremity of Pangutarang island, consists of a mangrove swamp with a small area of densely wooded solid land on the northern and western sides. The island is fringed with coral and is steep-to on the northern side. A bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends one mile from the south-eastern side of the island.

A shoal, with depths of from 21 to 30 feet ($6^{m}4$ to $9^{m}1$) over it, lies midway between Kulassein and Panducan islands. This shoal and the two islands lie close to the north-western edge of the great bank that forms the northern part of the Sulu archipelago. A shoal, with a least depth of 28 feet ($8^{m}5$) over it, lies 2½ miles east-south-eastward of the southern extremity of Kulassein island, and a shoal with a least depth of 25 feet ($7^{m}6$) over it, lies about one mile south-westward of the same point.

Teomabal island (*Lat. 6° 20′ N., Long. 120° 51′ E.*) lies near the south-western end of a bank, over which there is a least depth of 25 feet ($7^{m}6$), and 10½ miles eastward of Panducan island. It consists of a coral and sand beach fringing a mangrove swamp, the centre of which is a large lagoon; there are some prominent trees on the eastern side of the island.

Teomabal bank, with a least depth of 28 feet ($8^{m}5$) over it, lies about 6½ miles east-north-eastward of Teomabal island, with a deep channel, about 1¼ miles wide as defined by the 10-fathom ($18^{m}3$) line, between the bank and the north-eastern edge of the bank on which Teomabal island lies.

Tubigan island, 4 miles eastward of the northern extremity of Kulassein island, is 15 feet ($4^{m}6$) high on its western side; the eastern part consists of a mangrove swamp and a salt-water lagoon. Coral

Charts 2576, 943, 1263.

Chart 928.

reefs fringe the coast, and depths of less than 3 fathoms ($5^{m}5$), extend about three-quarters of a mile north-westward from the northern extremity. A shoal, with a depth of 28 feet ($8^{m}5$) over it, lies about one mile south-westward of the southern extremity of the island.

An extensive shoal, with a depth of 16 feet ($4^{m}9$) over it at its southern extremity, which lies about 1¾ miles east-north-eastward of the northern extremity of Tubigan island, extends with depths of less than 5 fathoms ($9^{m}1$) over it, for 4 miles northward, and has a least depth of 10 feet ($3^{m}0$) over it. In the channel between this shoal and Tubigan island there is a least depth of 8 fathoms ($14^{m}6$) in the fairway. The bank, of which this shoal, Pangutarang reef and Favorite bank are a part, extends 28 miles north-eastward from Tubigan island. The north-western side of this bank is very steep-to, depths of over 100 fathoms ($182^{m}9$) being found within a quarter of a mile of the 10-fathom ($18^{m}3$) line. The tidal streams over this bank are strong and irregular, but generally set north and south; it is not advisable for vessels to cross it, as the distance saved on the present trade routes would be very small.

The least depth over Pangutarang reef, which occupies the south-western part of the bank, is 7 feet ($2^{m}1$), situated 12¼ miles north-eastward of Tubigan island; this reef is marked by breakers. There are several other shoals on this reef, the positions of which may be seen on the chart.

The least depth over Favorite bank, which lies north-eastward of Pangutarang reef, is 25 feet ($7^{m}6$) in a position 20½ miles north-eastward of Tubigan island, and there is a 5-fathom ($9^{m}1$) patch at the northern extremity.

The northern edges of Pangutarang reef and Favorite bank are often marked by heavy tide-rips, especially during the North-east monsoon, or when the wind is against the stream.

The islands and dangers off the north-western side of Jolo island are described on page 218, and those eastward of Favorite bank on page 228.

TAWITAWI GROUP.—This group of islands extends from Bongao island (*Lat. 5° 01′ N., Long. 119° 45′ E.*), at the south-western end, to Bubuan and Maniacolat islands, at the north-eastern end, a distance of 58 miles. Tawitawi island is by far the largest of the group, and south-westward of it are Sanga Sanga, Bongao, Simunul, and Manuk Manka islands, which have been described with Sibutu passage on page 147.

The islands are all wooded, the trees being from about 50 to 100 feet ($15^{m}2$ to $30^{m}5$) in height, except Parangan island (page 200), and the coasts are defined by coral in some form or by mangroves growing below the high-water line.

The tidal streams amongst the group are strong.

Chart 2576, plan of Port Bongao.

Port Bongao.—Light.—Dangers.—Port Bongao is formed by Sanga Sanga, Bongao, and Papahag islands, and is a good harbour for small vessels.

Papahag island, separated from the north-eastern side of Bongao island by Aguada bay, and from the southern side of Sanga Sanga island by Chongos bay and Sanga Sanga channel, is 70 feet ($21^{m}3$)

Charts 1868, 2576, 943, 2660b, 1263.

Chart 2576, plan of Port Bongao.

high on its northern side and is densely wooded. The southern and south-western coasts consist mostly of sand and coral, with short stretches of mangrove; the northern coast is bordered by mangrove. Reefs extend from the eastern side of Bongao island and from the western side of Papahag island, leaving a narrow channel in the approach to Bongao, with a least depth of 3¼ fathoms (5^{m}9) in the fairway.

A 2¾-fathom (5^{m}0) patch lies on the western side of the channel, 2½ cables eastward of Lamion point (*see* below).

Two detached patches, with a least depth of about 4 feet (1^{m}2), rock, over the northern one, lie west-north-westward of Matos point, the southern extremity of Papahag island, and about a quarter of a mile from the south-western side of Papahag island.

A bank, with depths of less than 5 fathoms (9^{m}1) over it, extends about 3½ cables southward from Matos point; from the south-eastern side of the island a bank, with depths of less than 3 fathoms (5^{m}5) over it, extends a quarter of a mile offshore, and at about 4 cables eastward of Matos point is a shoal, with a least depth of one foot (0^{m}3), coral, at its northern end.

A light is exhibited, at an elevation of 30 feet (9^{m}1), from a concrete beacon, on the outer end of the sand spit extending north-eastward from Dila point, the north-eastern extremity of Bongao island.

Anchorages. — Directions. — Anchorage may be obtained in Aguada bay, in a depth of 7 fathoms (12^{m}8), sand and coral, three-quarters of a mile westward of Matos point, but it is open to the southward; also about 2 cables northward of Bongao light-beacon, in a depth of 7 fathoms (12^{m}8). Small craft may anchor north-westward of the wharf at Bongao, in depths of from 2 to 5 fathoms (3^{m}7 to 9^{m}1).

Anchorage may be obtained in Chongos bay southward of Malasa point, the eastern entrance point of Pandan bay, in a depth of 12 fathoms (21^{m}9), mud, but it is exposed to the south-eastward; also at the head of Pandan bay, in a depth of 6 fathoms (11^{m}0).

The approach to the anchorage in Aguada bay, and that northward of Bongao light beacon from westward lies southward of Bongao island; Bongao channel, between Sanga Sanga and Bongao islands, is seldom used. To enter Aguada bay a vessel should keep Maangit point, the south-eastern extremity of Papahag island, in line with Thumb hill (chart 1868), bearing 048°, until Bongao light-beacon (*Lat. 5° 02′ N., Lat. 119° 46′ E.*) bears 333°, when she should steer 000° until the light-beacon bears 307°, when she should steer for it on this bearing until Lamion point, about 4 cables southward of Dila point, is abeam, and then steer 318°, passing about half a cable north-eastward of the light-beacon and thence steer for the anchorage.

If approaching from eastward the vessel should steer for Bongao peak, bearing more than 270°, to clear the shoal extending from the southern side of Papahag island; when Bongao light-beacon bears 307° she should steer for it on that bearing and follow the directions given above.

A vessel from westward bound for Chongos bay or into Port Bongao by Sanga Sanga channel should not bring Thumb hill (chart 1868) to bear more than 039° until Matos point bears 272°, to avoid the shoal extending from the south-eastern side of Papahag island. To enter Sanga Sanga channel she should give the eastern side of Papahag island

Charts 1868, 928, 2576, 943, 2660b, 1263.

Chart 2576, plan of Port Bongao.

a berth of a quarter of a mile until Panihugan point, on the northern side of the channel, bears 265°, when she should keep in mid-channel steering about 263°, and thence to the anchorage northward of Bongao light-beacon. There is a least depth of 6¼ fathoms ($11^{m}4$) in the fairway of this channel.

If proceeding to the anchorage at the head of Pandan bay, she should keep the eastern extremity of Papahag island bearing more than 152°, astern, to clear the shoals on the western side of the bay.

Bongao.—Bongao, situated at the north-eastern end of Bongao island, is the largest village in the vicinity, and is the headquarters of the constabulary. There is a small wharf with a narrow causeway leading to it, and a depth of 3 fathoms ($5^{m}5$) alongside; there is little manœuvring room for vessels approaching it. There is communication by launch with Jolo, Sibutu, and Siasi.

Radio station.—There is a radio station at Bongao. *See* page 14.

Chart 1868.

Manalik channel.—Manalik channel lies between Sanga Sanga island and the south-western end of Tawitawi island, and has a least depth of 7 feet ($2^{m}1$) in the fairway near Carmen point, situated on the eastern side, 1½ miles from the entrance point of the southern end. The northern part of the channel is locally known as Luuk Saul, where vessels with local knowledge may obtain a well protected anchorage, in a depth of about 4 fathoms ($7^{m}3$). The channel is tortuous with several narrow and sharp turns, and the tidal streams attain a rate of 5 knots, the in-going stream setting in at both ends. The shores are bordered with mangrove.

Takut Mataha is a large coral reef, which dries, with Mandolan island on its south-eastern side, lying across the northern entrance to Manalik channel, leaving a passage on either side, that on the south-western side being the deeper, but it has several sharp turns; this passage is divided by a reef, which dries, into two rather narrow channels, the northern of which has a depth of about 9 fathoms ($16^{m}5$) in the fairway, and is the one recommended when entering from westward. The passage north-eastward of Takut Mataha has a depth of 3 fathoms ($5^{m}5$) and no sharp turns and on that account is preferred by small craft.

Sambilong island (*Lat. 5° 07′ N., Long. 119° 48′ E.*) lies on the western side of Manalik channel, about 2½ cables southward of Mandolan island, and eastward of it the channel leads into Luuk Saul, a great part of which is foul.

Charts 1868, 928.

Tawitawi island.—The most conspicuous peaks are Mount Sibankat, 1,800 feet ($548^{m}6$) high, the middle and highest of three peaks lying at the northern end of a range situated near the middle of the island; Thumb hill, 663 feet ($202^{m}1$) high, lying 3 miles north-eastward of the south-western extremity of the island; Mount Bud Bas, 1,145 feet ($349^{m}0$) high, and Mount Bud Butua, a sharp wooded peak, 820 feet ($249^{m}9$) high, situated about 3 and 7 miles, respectively, south-westward of the north-eastern extremity of the island.

Northern coast of Tawitawi island.—The northern coast is clear of off-lying dangers except those comprising the shoals surrounding the Tataan islands at the western end, and the 4¼-fathom ($7^{m}8$) patch off Port Languyan (page 199). This side of the island

Charts 1868, 928.

is densely covered with trees of exceptional height, and the coast is for the greater part, bordered by ranges of low hills.

Chart 1868.

From Bugut Lapit point, situated about 2¾ miles north-north-eastward of the northern extremity of Sanga Sanga island, to Bacung (Bakung) point, about 10 miles farther north-eastward, the coast consists of coral and mangrove.

At the head of a small cove, situated 3½ miles south-south-westward of Bacung point, are the remains of an abandoned settlement and of an old mole; the cove is fronted by two reefs which lie about 3½ cables offshore.

Tataan islands.—Tataan islands are a number of low coral islands lying from one to 2½ miles off the coast of Tawitawi island between Bugut Lapit and Bacung points. These islands are wooded with trees from 50 to 60 feet (15^{m}2 to 18^{m}3) in height, and are fringed by coral reefs which are plainly visible. The north-western edges of these reefs are bounded by coral barrier reefs, and, except for the shallow area between Tinagta and Sipayu islands at the south-western end of the group, are dry except at high water; they are an excellent navigational aid when approaching the islands. Coral shoals, which dry, extend from the south-eastern side of the islands.

Sipayu island, the south-westernmost of the Tataan islands, lies about three-quarters of a mile north-eastward of Bugut Lapit point, and about 4 cables from the coast of Tawitawi island. The island is low and covered with scrub; a coral reef extends from 1½ to 3½ cables from its northern side. A channel leading into the western end of Tataan pass lies southward of Sipayu island.

Tinagta, Basun Dakula and Basun Sibi Sibi islands, lie on the same barrier reef, from 2¾ to 4¾ miles north-eastward of Sipayu. Between the south-western end of this reef and Sipayu island there is an extensive area of depths of from about one foot to 5 fathoms (0^{m}3 to 9^{m}1), but there is a channel lying close southward of the barrier reef, about a quarter of a mile wide, with a least depth of 7 fathoms (12^{m}8), leading into the western end of Tataan pass.

Basun channel, lying close eastward of Basun Sibi Sibi island (*Lat. 5° 13′ N., Long. 119° 54′ E.*), and between the barrier reef on which that island lies and the barrier reef eastward of it, has a least depth of 16 fathoms (29^{m}3) at the southern end; it leads into the northern side of Tataan pass, but it is not recommended as the edges of the reef on either side are difficult to distinguish.

On the reef on the eastern side of Basun channel are two low wooded islands.

Nusu Tacbu channel, in which there is a least depth of 5½ fathoms (10^{m}1) in the fairway, leads through the barrier reef into Tataan pass, about one mile eastward of Basun channel. The edges of the reefs on either side are easily seen if conditions are favourable. At the southern end of the channel, shoals, with depths of from 2 to 4 fathoms (3^{m}7 to 7^{m}3) over them, extend from either side, so care should be taken to keep in mid-channel.

Cabancauan (Kabankauan) island, the largest of the group, lies about 1½ miles westward of Bacung point; it is fairly steep-to on its south-eastern side. Simalak Dakula and Simalak Sibi Sibi islands lie near the north-eastern end of the group; there is a village on the

Charts 928, 2576, 943, 1263.

Chart 1868.

southern side of Simalak Dakula. An extensive shoal area extends from half to three-quarters of a mile north-westward of these islands.

Tataan pass.—Tataan pass, between the northern coast of Tawitawi island and the Tataan islands, affords excellent anchorage, in depths of from 10 to 15 fathoms ($18^{m}3$ to $27^{m}4$), coral sand, or mud.

Directions.—To enter Tataan pass by the western channel a vessel should steer for the southern side of Sipayu island, bearing 092°, and when Bugut Lapit point is abeam she should alter course southward and pass from one to 1¼ cables southward of the island. These courses pass about one cable southward of a 4¼-fathom ($7^{m}8$) patch lying about 7 cables westward of Sipayu island. When abeam of Sipayu island she should alter course northward and proceed into Tataan pass.

A vessel with local knowledge may also enter Tataan pass through the channel about one cable southward of the coral barrier reef which lies south-westward of Tinagta island. This channel is about a quarter of a mile wide and has a least depth of 6 fathoms ($11^{m}0$).

Chart 928.

Coast.—The coast between Bacung point and Tocanhi (Tokanhi) point, about 6 miles north-eastward, is free of dangers except for a 25-foot ($7^{m}6$) patch lying about 7 cables north-westward of the latter point; the 5-fathom ($9^{m}1$) line is about 1½ cables offshore. There are two indentations, Moco cove and Maraning bay, which, although shallow, have sufficient depths for small craft; they are entered about 1¾ and 2¾ miles, respectively, eastward of Bacung point. The coast is fringed with coral at the exposed parts and with mangrove, coral, and mud in the bights, and is wooded to the high-water line.

Port Languyan, entered between Tocanhi point and Languyan point, about 3 cables north-eastward, is bordered by mangrove; it is about 1½ cables in width and extends southward for about half a mile and then turns east-north-eastward. The port affords excellent anchorage for vessels with local knowledge, in a depth of 7 fathoms ($12^{m}8$), over a mud bottom at the turn. Vessels should keep in mid-channel on entering and as far as the anchorage. The entrance is difficult to distinguish until close inshore.

The coast between Languyan point (*Lat. 5° 17′ N., Long. 120° 05′ E.*) and Tarinen point, the northern extremity of Tawitawi island, is steep-to and clear of dangers outside a distance of 1½ cables offshore; it is bordered by coral reef and mangrove, and is wooded to the water's edge. There are three small coves which afford shelter to small craft. South-westward of Mount Bud Butua are some hills, whence a valley extends towards the hills which appears as a ridge north-eastward of Mount Bud Bas; the highest point on this ridge is Mount Baluk Sampan, a peak, 1,050 feet ($320^{m}0$) high, which appears conical from east and west, which is prominent.

Tidal streams.—The tidal streams off the north coast of Tawitawi island are weak. The north-east-going stream from Sibutu passage meets the south-west-going stream from eastward of Tawitawi island off Tongehatan point, about 2 miles westward of the northern extremity.

Charts 1868, 928.

TAWITAWI BAY.—Tawitawi bay is the name given to the large body of water between the southern side of Tawitawi island and the

Charts 2576, 943, 1263.

off-lying islands and reefs. A large part at the western end has depths of from 12 to 20 fathoms ($21^{m}9$ to $36^{m}6$) and is clear of dangers; the eastern part of the bay is encumbered by banks and shoals, among which there are many navigable channels, but only vessels with local knowledge should attempt to enter this part of the bay.

Northern side of Tawitawi bay.—The southern coast of Tawitawi island is flat and fringed with coral and bordered with mangrove except in the immediate vicinity of the few villages. Thumb hill (page 197) is the most prominent landmark, showing from nearly all directions as the frustum of a cone; there is a prominent tree on its summit, which is visible from a distance of from 15 to 20 miles. Bud Luuk and Bud Sikala, 475 and 440 feet ($144^{m}8$ and $134^{m}1$) high, respectively, lie about 2¾ miles east-north-eastward of Thumb hill, and are noticeable from southward, showing as twin hills.

Tangu island, covered with mangrove, lies on a spit, which has depths of less than 3 fathoms ($5^{m}5$) over it, extending 1½ miles south-eastward from the eastern entrance point of the southern end of Manalik channel (page 197), and half a mile from the southern side of Tawitawi island; the spit extends 1¼ cables south-eastward from Tangu island.

Luuk Sula, an inlet entered between Patong point, situated about 2½ miles eastward of the eastern entrance point of Manalik channel, and Malaka point, 1¼ miles east-north-eastward of Patong point, affords well protected anchorage for vessels with local knowledge, in depths of from 4 to 6 fathoms ($7^{m}3$ to $11^{m}0$), mud. Two reefs, which dry about 3 feet ($0^{m}9$), lying about 4 cables east-north-eastward and 3½ cables north-north-eastward, respectively, of Patong point, afford protection from southward; they may be discerned at all times and should be avoided by keeping to the northern shore. The shores of Luuk Sula are bordered by mangrove.

Batu Batu bay is entered between Malaka point and Marukal point, half a mile north-eastward. There is a small wharf on the eastern side of the bay at New Batu Batu, a settlement of Visayans; there is a depth of 14 feet ($4^{m}3$) at the head of the wharf, but a reef which lies close westward of the wharf, prevents its use by any but small craft. The settlement is situated behind a hill and cannot be seen from the bay. The Moro town of Batu Batu is situated on the coast westward of Batu Batu bay.

Malum river, entered about one mile north-eastward of Marukal point, is about half a cable wide at its mouth, but inside narrows to a width of about 30 yards ($27^{m}4$), which is maintained for about 3 miles. Eastward of the river the country becomes more rugged.

Lubucan (Lubukan) island (*Lat. 5° 04′ N., Long. 119° 55′ E.*), about 1¾ miles eastward of Marukal point, is connected to the southern side of Tawitawi island by a mud and sand reef, which dries. The island is low and flat and its coast is fringed with mangrove except a small part on the southern side, where there is sand and rock. A reef, which dries, extends about three-quarters of a cable offshore in places.

Parangan island lies 5¼ cables north-eastward of Lubucan island and close off the southern side of Tawitawi island. Coral reefs fringe the island, almost closing the narrow channel which separates the island from Tawitawi. At the north-eastern end of the island there is a hill, 200 feet ($61^{m}0$) high, shaped like the frustum of a cone, and at the

Charts 1868, 928.

south-western end, a hill 115 feet (35^{m}0) high. The island is inhabited and well cultivated.

Luuk bay lies northward of Lubucan island and westward of Parangan island. Anchorage may be obtained by vessels with local knowledge, in a depth of about 8 fathoms (14^{m}6), mud.

Bunay Bunay islet lies on the coastal reef close westward of Balimbing point, situated about 2¼ miles eastward of Lubucan island; it has a few coconut trees on it, but is not inhabited.

Parangan bay, between Parangan island and Bunay Bunay islet, affords anchorage to vessels with local knowledge, in depths of from 8 to 10 fathoms (14^{m}6 to 18^{m}3), mud. This anchorage is more exposed than that in Luuk bay, but it is nearer Balimbing, situated close eastward of Balimbing point, the largest village in this part of Tawitawi island.

About three-quarters of a mile north-westward of Balimbing point is Bud Sitingan, 700 feet (213^{m}4) high, which is noticeable when the sun is shining on it, showing as a reddish cliff.

Chart 928.

Eastward of Balimbing point the coast is low and bordered with mangroves which are intersected by several small rivers. Most of the smaller islands and parts of the larger ones consist of mangrove. Of the latter, Lupa, about 1½ miles north-eastward of Balimbing point, is low and is partly cultivated. Buan island, separated from the southern side of Tawitawi by a narrow channel, lies 4¼ miles north-north-eastward of Lupa island (*Lat. 5° 06′ N., Long. 119° 59′ E.*). It has a rounded hill, 280 feet (85^{m}3) high, which slopes to a mangrove swamp on its eastern side. The island is inhabited and cultivated.

In Buan bay, westward and northward of Buan island, there are numerous coral shoals.

About 4½ miles eastward of Buan island are the Taata islands, low mangrove islands, wooded in the middle. Sikaula island, 80 feet (24^{m}4) high, lies close eastward of the northernmost of the Taata islands and is joined to the main island northward by mangroves. Dungun river, which flows out westward of Sikaula island, is about half a mile wide at its mouth, and is much discoloured. There is a least depth of 2 fathoms (3^{m}7) over the bar on the eastern side of the entrance and thence for about 4½ miles up the river. Several of the other rivers on this coast have depths of one and 2 fathoms (1^{m}8 and 3^{m}7) at their mouths, but are narrow and navigable only a short distance.

Baliungan island, close eastward of Taata islands, is fringed with mangroves and is separated from the southern side of Tawitawi island by Tausan Mariki channel, which is reported to have a depth of 3 fathoms (5^{m}5) in it. The island is 1,062 feet (323^{m}7) high on its eastern side, and densely wooded, but it is low on the western side. Calva island, 330 feet (100^{m}6) high, and three other islands, lie on the edge of the reef extending from the eastern side of the island.

Chart 1868.

Off-lying islands and dangers.—Beacon.—Sangasiapu islet, about 5 miles south-eastward of Bongao island, is a flat coral islet, 10 feet (3^{m}0) high, with a few coconut trees, lying on a reef which is steep-to on its southern side, but from its northern side a bank of sand and coral, with depths of less than 3 fathoms (5^{m}5) over it, extends

Charts 2576, 943, 1263.

Chart 1868.

about 1¾ miles north-westward; there are several patches with depths of less than 6 feet ($1^{m}8$), on this bank. A 2¾-fathom ($5^{m}5$) patch lies about 2¼ miles west-north-westward of the islet.

Chart 928.

Laa island (*Lat. 4° 56′ N., Long. 119° 52′ E.*), 2¼ miles south-eastward of Sangasiapu islet, is covered with a dense growth of coconut trees, and fringed by a coral reef which is entirely covered at high water. A shoal, with a depth of 3 fathoms ($5^{m}5$) over it, lies one mile north-westward of Laa island, and about midway between them is a reef with a white sand cay, about 3 feet ($0^{m}9$) high. The channels on the eastern and western sides of Laa island have been swept to a depth of 30 feet ($9^{m}1$), and may be used during good visibility; the tidal streams here set north-eastward and south-westward at an average rate of 3 knots.

Simunul and Manuk Manka islands, southward of Sangasiapu islet, have been described with Sibutu passage on page 147.

Tijitiji reef, the greater part of which dries, is separated from the eastern side of Simunul island by a very deep channel about 1¼ miles wide, the edges of which can easily be seen. The channel between the reef and Laa island is about one mile wide, with a least depth of 6½ fathoms ($11^{m}9$) in the fairway. A bank with depths of less than 3 fathoms ($5^{m}5$) over it, extends about 2 miles northward and north-eastward from the part of Tijitiji reef that dries.

A wooden beacon stands on the southern extremity of Tijitiji reef, and is visible 2 or 3 miles.

Charts 1868, 928.

Bilatan island, low, flat, densely wooded, and of coral formation, lies 9¼ miles north-eastward of Simunul island; it lies on the eastern side of an extensive reef which extends about 6 miles south-westward, and about 4 miles northward. On the reef which extends south-westward are the Tijitiji islands, of the same formation as Bilatan island and with a similar abrupt coral coast line. Tinundukan island, one of the group, lying about 2½ miles south-westward of Bilatan island, is sandy and cultivated; a few of the other islands of the group are also cultivated.

Balseyro channel, between the south-western edge of the reef extending south-westward from Bilatan island and Tijitiji reef, has a least depth of 4 fathoms ($7^{m}3$) near the northern end; this channel is not recommended as the tidal streams in it are strong.

Biloc Biloc (Bilok Bilok) reef is the continuation of the reef northward of Bilatan island, and forms the southern side of Balimbing channel. Dulangdulang rocks, about 12 feet ($3^{m}7$) high, mark the north-western edge of the reef, and are a good landmark for entering the channel from westward. The northern and eastern edges of this extensive reef are well-defined and steep-to, but the western edge is more irregular and shoals extend about one mile from it. From the north-western point a spit, with depths of less than 5 fathoms ($9^{m}1$) over it, extends 1½ miles westward. On this spit is a rock awash, situated three-quarters of a mile westward of the Dulangdulang rocks.

Jinhling islands extend about 1½ miles northward from Tungbanghan point, the northern extremity of Bilatan island; they are almost entirely covered with mangroves.

Chart 928.

Basibuli reef is an extensive reef, steep-to except on its south-eastern

Charts 2576, 943, 1263.

Chart 928.

side, separated from the middle of the eastern side of Biloc Biloc reef by a deep channel. Basibuli islands are a group of coral rocks lying near the middle of Basibuli reef, and Panampanang island, a small sandy island, lies at the north-eastern side of the reef; they are covered with trees and vegetation, but are not inhabited.

Mundi rocks are two small coral rocks, 16 feet (4^m9) high, lying near the north-western edge of a large reef which dries, about 2¾ miles north-north-eastward of Panampanang island. This part of Tawitawi bay is encumbered with numerous shoals rising abruptly from depths of from 5 to 10 fathoms (9^m1 to 18^m3) to within 3 or 4 feet (0^m9 to 1^m2) of the surface, and some dry.

Banaran, Sasa, and Mantabuan islands lie on the same extensive reef, the western extremity of which is separated from the south-eastern edge of Basibuli reef (*Lat. 5° 03′ N., Long. 120° 03′ E.*) by a channel about one mile wide, with a least depth of 34 feet (10^m4) in the fairway. A barrier of coral rock extends along the southern edge of the reef, which is steep-to. There are several villages on the islands, the inhabitants of which cultivate tapioca, sugar cane, rice, bananas, and coconuts.

Latuan, Secubun (Sekubun), and Tandubas islands lie close together on the same extensive reef, which is separated from the reef fringing the north-eastern side of Mantabuan by Salang channel, which is about one mile wide, with a least depth of 6 fathoms (11^m0) in the fairway, but there are several patches, with depths of from 25 to 30 feet (7^m6 to 9^m1) at the inner end of the channel. The reef extending south-westward from Latuan dries and its edge bordering Salang channel is not well defined. The islands are low, flat, and densely wooded in the interior, but cultivated along the coasts.

Bahang channel, between Latuan and Secubun islands, is narrow and tortuous, with a least depth of 12 fathoms (21^m9); the tidal streams in it are strong, but the reefs on either side can easily be seen. The channel between Secubun and Tandubas islands is suitable only for native craft.

Charts 1868, 928.

Anchorage.—Directions.—Anchorage, protected from the swell, may be obtained anywhere in Tawitawi bay where there is sufficient swinging room. The bottom is generally mud or sand, and the tidal streams do not run at a rate of more than 2 knots. The best anchorage and nearest to the open sea, for vessels with local knowledge, is north-westward of the north-western end of Banaran island, in depths of from 6 to 7 fathoms (11^m0 to 12^m8), hard bottom, or in 12 fathoms (21^m9), sand, north-eastward of the same point; the latter anchorage is protected from the swell. Banaran island is low and affords little protection from the wind.

A vessel approaching these anchorages should enter Tawitawi bay by the channel between Basibuli reef and the north-western end of Banaran island, and steer 024°, keeping in mid-channel.

The western part of Tawitawi bay is easy to navigate. If coming from westward a vessel should give Bongao island a berth of at least half a mile. She may also enter the bay between the reef on which Sangasiapu island lies and the sand cay about 1¼ miles south-eastward of it, or by passing half a mile south-eastward of Laa island, steering 040°.

Charts 2576, 943, 1263.

Charts 1868, 928.

If proceeding through Balimbing channel, the vessel should steer about 077° to pass a quarter of a mile off the point south-westward of Balimbing point (*Lat. 5° 05′ N., Long. 119° 58′ E.*), and enter the channel on this course. A depth of about 4 fathoms ($7^{m}3$) may be carried through the channel. Vessels with local knowledge may reach the anchorages northward of Banaran island by this channel or proceed into the open sea between Biloc Biloc and Basibuli reefs.

Tidal streams.—Among the islands and shoals off the southern side of Tawitawi bay the in-going stream sets north-westward, but deviates to conform to definite channels. In the channel between Simunul island and the reefs eastward and north-eastward of it the tidal streams are strong and set fair with the channel. South-eastward of Tawitawi bay, where there are considerable depths, the streams are weak and irregular.

Chart 928.

ISLANDS AND DANGERS OFF THE NORTH-EASTERN SIDE OF TAWITAWI ISLAND.—Kang Tipayan Diki (*Lat. 5° 27′ N., Long. 120° 11′ E.*) and Kang Tipayan Dakula islands, of coral atoll formation, and covered with trees from 40 to 100 feet ($12^{m}2$ to $30^{m}5$) in height, lie 5¾ miles northward of the northern extremity of Tawitawi island. The interior of the islands consist of shallow salt-water lagoons, encumbered with mangrove clumps ; the entrances to these lagoons dry. *See* view facing this page.

Kang Tipayan Dakula, the eastern of the two islands, is fronted by a coral barrier reef on the north-eastern side, and Kang Tipayan Diki on all sides. On the former there is a stretch of sand beach on the southern side. Midway between the two islands there is a coral shoal, with a least depth of one foot ($0^{m}3$) over it, but there is a deep channel on either side of it, with a least depth of 31 feet ($9^{m}4$) on the western side and 40 feet ($12^{m}2$) on the eastern side. A shoal, with a depth of 40 feet ($12^{m}2$) over it, lies about three-quarters of a mile from the north-eastern side of Kang Tipayan Dakula.

Basbas island, 230 feet ($70^{m}1$) high, and densely wooded, is separated from the northern extremity of Tawitawi island by Basbas channel. On the summit of the island is a very prominent umbrella-shaped palm tree. Most of the western side is fringed with mangrove, but there are some stretches of firm land ; the south-western side is also fringed with mangrove. There is a village on the western side of the island.

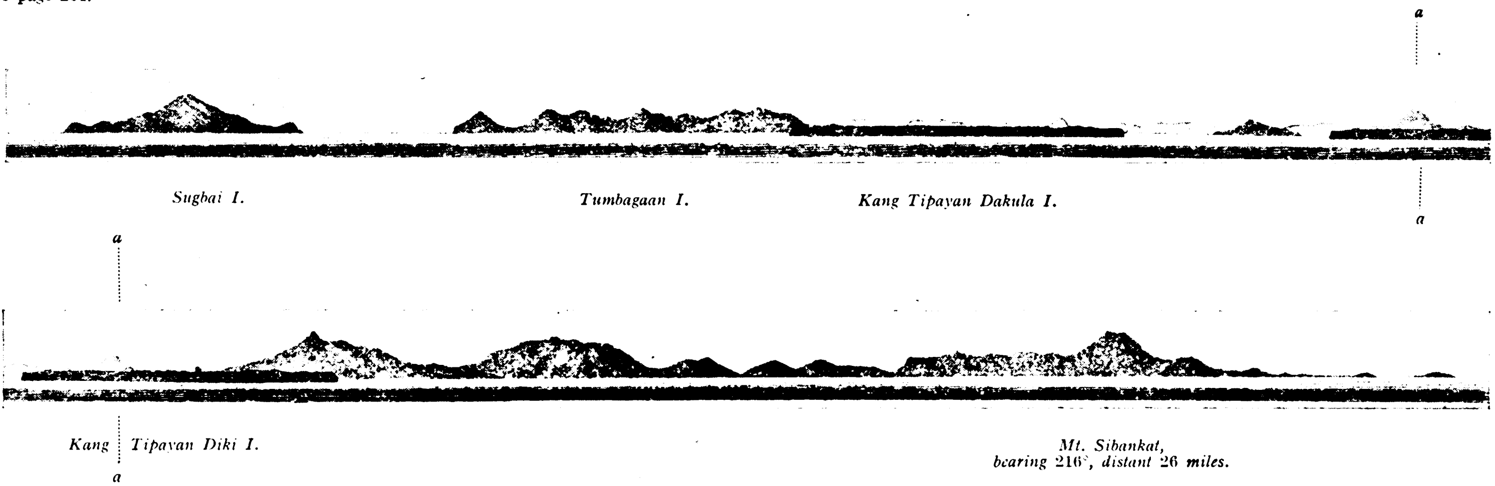
Basbas channel has a depth of 8 fathoms ($14^{m}6$) in the fairway as far south as the anchorage, which is situated about half a mile northward of the northern extremity of Tabolongan island, and has a least width of about 3 cables.

Tabolongan island, about half a mile south-south-westward of Basbas island, is separated from the eastern side of Tawitawi island by Himba channel, which is foul and intricate. The island is low and covered with trees from 140 to 170 feet ($42^{m}7$ to $51^{m}8$) in height, and is fringed with mangrove except at the northern end.

Pahumaan island (*Lat. 5° 21′ N., Long. 120° 16′ E.*) is a low, coral wooded island lying 1¼ miles eastward of Basbas island, with several islets and dangers between them. The northern half of the island is planted with coconut-trees, and the southern half is overgrown with mangroves. About half a mile southward of Pahumaan island are

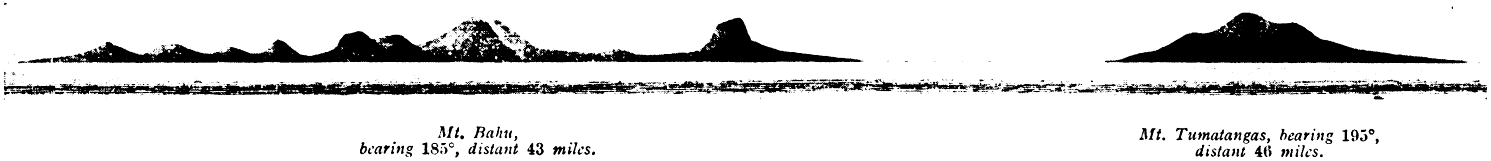
Charts 2576, 943, 1263.

To face page 204.



View, in two parts, of the northern coast of Tawitawi island and adjacent islands.

(*Original dated prior to* 1873.)


Mt. Bahu,
bearing 185°, distant 43 miles.
Mt. Tumatangas, bearing 195°,
distant 46 miles.

Jolo island.

(*Original dated prior to* 1879.)

Chart 928.

two rocky islets, and at about three-quarters of a mile south-south-eastward of the islets is a rock which dries about 2 feet (0^m6).

Within a distance of about 5 miles south-eastward of Basbas island (*Lat. 5° 21′ N., Long. 120° 14′ E.*), are Gol-loman, Tancan (Tankan), Baturapac, and numerous other islands and dangers, the positions of which may best be seen on the chart.

Tumbagaan island, 611 feet (186^m2) high, and partially wooded, lies about 2 miles north-eastward of Pahumaan island. The eastern and western ends and the points on the northern side consist of rocky cliffs, elsewhere the coast is fringed with coral and coral sand. There is a well-defined hill, 402 feet (122^m5) high, at the eastern end of the island. There are several villages on the island. There is a lagoon, with a depth of one foot (0^m3) in its entrance, situated at the western end of the northern side of the island.

Boso Dohonan are two rocks, 4 and 8 feet (1^m2 and 2^m4) high, lying about half a mile south-eastward of the southern extremity of Tumbagaan island, and another rock, 4 feet (1^m2) high, lies half a mile southward of the same point. A 25-foot (7^m6) patch lies about one mile eastward of Boso Dohonan rocks. Several shoals, with depths of from 7 to 34 feet (2^m1 to 10^m4) over them, lie between Tumbagaan and Pahumaan islands.

Sugbai island, with twin peaks, 770 feet (234^m7) high, and densely wooded, lies 1¾ miles east-north-eastward of Tumbagaan island, with a deep channel clear of dangers between. The coast is fringed with coral and coral sand, except on the northern side and eastern end where there are rocky cliffs. There is a large lagoon, into which there is no entrance, on the southern side of the island. The island is uninhabited. The eastern half of the island appears as a flat ridge ; the western half slopes gradually to the west point, near which there is a low prominent hill. *See* view facing page 204.

A bank, with a depth of 22 feet (6^m7) at its outer end, extends about 3½ cables from the north-western side of the island, and a 15-foot (4^m6) patch lies about half a mile from the middle of the southern side. A good anchorage may be obtained by vessels with local knowledge, in a depth of 7 fathoms (12^m8), north-eastward of the 15-foot (4^m6) patch, but there is a 22-foot (6^m7) patch situated close off the southern side of Sugbai island north-eastward of the anchorage, which should be avoided if approaching from eastward.

In the area bounded on the west by the north-east coast of Tawitawi, and on the east by a line drawn southward from the eastern extremity of Tumbagaan island, there are numerous islands and dangers, the positions of which may best be seen on the chart.

Pandanan island, of coral formation and with trees about 60 feet (18^m3) high, lies 5¼ miles south-south-eastward of Sugbai island. Tancolaluan (Tankolaluan) island, about 3½ miles eastward of Pandanan island, has a small hill, the trees on which have an elevation of about 70 feet (21^m3). There are twin rocks, 2 feet (0^m6) high, lying about 2 cables westward of Tancolaluan island.

Tandubatu island, separated from the eastern end of Tawitawi by the Gallo Malo channel, which is encumbered with shoals, lies 4¼ miles southward of Basbas island. The island is 488 feet (148^m7) high near the eastern side, and densely wooded ; the coasts are fringed by mangrove and coral reefs.

Charts 2576, 943, 1263.

Chart 928.

All the islands in this vicinity are inhabited by Moros who are friendly. There are two fair-sized villages, one on the eastern side of Tandubatu island and one on the south-eastern side of Naungan Dakula island, situated 3¼ miles eastward of the northern extremity of Tandubatu island.

Situgal Hea island, 255 feet (77m7) high, and densely wooded, is separated from the north-eastern side of Tandubatu island by a channel in which a depth of about 8 feet (2m4) can be carried. There is an extensive reef in the north-western entrance of the channel. The greater part of the coast line of the island is bordered by mangrove. Extensive reefs extend about one mile from the northern side of the island.

Tandungan channel, between Tandubatu and other off-lying islands on the west, and Calupag (Kalupag), Tandungan, and Dundangan islands on the east, has a least width of 3½ cables. Vessels with local knowledge, with a maximum draught of 19 feet (5m8), may use this passage which is sheltered from the heavy seas during the South-west monsoon, but there are numerous reefs some of which dry, on either side of the fairway. Anchorage may be obtained anywhere in the channel.

Calupag island (*Lat. 5° 16′ N., Long. 120° 22′ E.*), 276 feet (84m1) high, lies 7 miles southward of Sugbai island. The southern and most of the eastern coasts are bordered by mangrove; the northern and north-eastern coasts are fringed with white coral beaches. Bakeke islet, 20 feet (6m1) high, lies about 3 cables northward of Calupag island, and about 4 cables farther northward is a one-fathom (1m8) patch. A 5-fathom (9m1) patch lies about 1½ miles north-north-westward of the island. A 15-foot (4m6) patch lies three-quarters of a mile north-eastward of the eastern point of Calupag island.

Tandungan island, about half a mile south-westward of Calupag island, has a flat-topped hill, 497 feet (151m5) high, near the middle of the island, and is heavily wooded. The coast is bordered with mangrove, and coral reefs extend from a quarter of a cable to one cable offshore on the eastern side. There are a few small villages on the eastern and western sides. Close off the northern side of the island is Sarucsarucan island, 195 feet (59m4) high.

Dundangan island is separated from the southern side of Tandungan island by Salang Salangan channel, a narrow passage through which a depth of 6 feet (1m8) can be carried, but there are several sunken rocks to be avoided, both in the channel and its eastern approach. The island is 380 feet (115m8) high near the northern end, and heavily wooded; the coast is bordered by mangrove and coral reefs to a large extent. There are several villages on the coasts of the island. At the western end of Salang Salangan channel is an island, 173 feet (52m7) high, off the northern extremity of which an extensive coral reef extends about half a mile.

From the southern end of Tandungan channel there is a channel which leads between Tandubatu and Tandubas islands, passing close southward of the former, and thence into the eastern end of Tawitawi bay. It is, however, very intricate and narrow in parts and should only be used by vessels with local knowledge.

Pasegan Guimba and Pasegan Samal islands, lying about one mile and 2¾ miles, respectively, eastward of the south-eastern extremity of

Charts 2576, 943, 1263.

Chart 928.

Tandungan island, are low flat coral islands, wooded with coconut trees, from about 70 to 90 feet (21^{m}3 to 27^{m}4) in height, and fringed with coral reefs. There are several shoals in the vicinity of these islands, the positions of which may be seen on the chart.

Calaitan islets lie on the western edge of an extensive reef, which dries from one to 2 feet (0^{m}3 to 0^{m}6), separated from the south-eastern side of Dundangan island by Calaitan channel, which is only navigable for vessels of less than 6 feet (1^{m}8) draught.

Bacutcut (Bakutkut) bank, which dries, is separated from the eastern side of the reef on which the Calaitan islets lie by Cambacamba (Kambakamba) channel, which has a least navigable width of about 3¼ cables, and a least depth in the fairway of 9 fathoms (16^{m}5). The tidal streams in this channel run at a maximum rate of 6 knots. At the south-eastern end of Bacutcut bank are the Tabuan islands, consisting of several islets and rocks, the largest of which is Tabuan island (*Lat. 5° 09′ N., Long. 120° 27′ E.*), which is inhabited. At the northern extremity of the bank are the Lijatlijat rocks, 3 feet (0^{m}9) high ; near the middle of the bank is a group of rocks, 15 feet (4^{m}6) high ; at the north-eastern edge are the Celandat islets, from 20 to 49 feet (6^{m}1 to 14^{m}9) high, and at the southern extremity, the Panolean islets, the highest of which has an elevation of 48 feet (14^{m}6).

Tacutboata (Takutboata) reef, which dries about 2 feet (0^{m}6), lies about three-quarters of a mile south-westward of the south-western edge of Bacutcut bank, and 2¼ miles westward of Tabuan island.

South Ubian island, 1½ miles eastward of Bacutcut bank, is fringed by a coral reef, which extends three-quarters of a mile from the south-eastern side ; on the southern edge of the reef there are several islets, the highest of which is 8 feet (2^{m}4) high. The island is the best cultivated and most thickly populated of any in this vicinity. There is a least depth of 5 fathoms (9^{m}1) on the western side of the passage between Bacutcut bank and the reef extending from the western side of South Ubian island. The reefs on either side of the passage are fairly easy to distinguish.

Loran island, 148 feet (45^{m}1) high at its northern extremity, which is steep-to, lies about three-quarters of a mile north-eastward of South Ubian island. It is fringed by a coral reef, which extends 6 cables from the southern side. Manote islet lies on this part of the reef, and some rocks, 3 feet (0^{m}9) high, lie on the fringing reef at the north-western end of the island. The island is inhabited and partly cultivated. There is a least depth of 19 feet (5^{m}8) in the fairway of the passage between South Ubian and Loran islands, which is about 2 cables wide at its narrowest part between the 3-fathom (5^{m}5) lines on either side.

Kinapusan islands. — The Kinapusan islands, consisting of Tabawan, Bintoulan, and Kinapusan, are low, densely wooded, coral islands lying from about 3 to 10 miles eastward of Loran island. Tabawan island is fringed by a reef which partly dries, and extends 1¾ miles from the southern side ; on the south-eastern edge of the reef are the Nusa islands, and close off the southern side of Tabawan is Laum Tabawan island. Tabawan (*Lat. 5° 13′ N., Long. 120° 35′ E.*) is thickly populated, Bintoulan and Kinapusan less densely. The chief occupation of the natives is fishing.

Bintoulan and Kinapusan islands lie on the same reef, separated

Charts 2576, 943, 1263.

Chart 928.

from that on which Tabawan island lies by a channel about one mile wide, with a least depth of 28 feet ($8^{m}5$) in the fairway. On the edge of the reef extending from these islands are many islets from one to 5 feet ($0^{m}3$ to $1^{m}5$) high.

The channel between the reefs extending from Loran and Tabawan islands is about 2¼ miles wide, with a least depth in the fairway of 37 feet ($11^{m}3$) but a depth of 10 fathoms ($18^{m}3$) can be carried by keeping nearer the western side. The edges of the reefs on either side dry at various stages of the tide, except the part south-eastward of Manote islet, where a bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends about one mile south-south-eastward from the islet. This channel is preferable to the others leading through this chain of islands; the high ground on Loran island is a good landmark for vessels using this channel.

A fair anchorage may be obtained, in a depth of about 13 fathoms ($23^{m}8$), with the western extremity of Guitong village, situated about the middle of the northern side of Tabawan island, bearing about 160°, about three-quarters of a mile offshore.

SUGBAI AND TAPAAN PASSAGES.—Sugbai and Tapaan passages lie on the south-western and north-eastern sides, respectively, of a group of islands, the principal of which are Cacatan, Maniacolat (*Lat. 5° 28′ N., Long. 120° 35′ E.*) and Bubuan.

Tapaan passage, which is about 7½ miles wide between Bubuan island on the west and Tapaan island on the east, has two shoals in the fairway, but there is a clear passage on either side of them. It is a convenient passage for a sailing vessel, as the tidal streams, which run at a rate of from 3 to 7 knots, set fairly through it, and in calms or light winds a vessel could anchor and await the change of tide.

Cacatan (Kakatan) island, low, flat, and covered with trees, about 80 feet ($24^{m}4$) in height, lies about 6 miles north-north-eastward of Sugbai island (page 205). A spit, with a depth of less than 3 fathoms ($5^{m}5$) over it, extends about 3½ cables from the northern side of the island, and a coral bank, with depths of from 28 to 60 feet ($8^{m}5$ to $18^{m}3$), extends 2¾ miles south-south-eastward from the southern side. The coasts of the island are fringed with coral and coral sand. A 34-foot ($10^{m}4$) rocky patch lies 4¼ miles south-south-eastward of Cacatan island, and between the island and Sugbai island are two banks, with a least depth of 36 feet ($11^{m}0$) over them.

Parangan islet, 88 feet ($26^{m}8$) high and conical, lies about 6½ miles eastward of Cacatan island. About 3½ cables westward of Parangan is a flat-topped islet, 14 feet ($4^{m}3$) high, from which a reef extends eastward, leaving a narrow passage between it and Parangan. A 33-foot ($10^{m}1$) patch lies about 2¼ miles north-westward of Parangan islet, and a 4-fathom ($7^{m}3$) patch lies about 4 cables southward of the islet.

Maniacolat (Maniakolat) island (*Lat. 5° 28′ N., Long. 120° 35′ E.*), 744 feet ($226^{m}8$) high, and densely wooded with a prominent peak, which appears conical from all directions except east and west, lies 2¼ miles southward of Parangan islet. The sides of the island are steep-to except on the south. Babuan islet, 37 feet ($11^{m}3$) high, and wooded, lies 4 cables westward of the south-western point of Maniacolat island, with a channel between. Maglumba islet, 133 feet ($40^{m}5$)

Charts 2576, 943, 1263.

Chart 928.

high, lies 1¼ miles eastward of the northern point of Maniacolat island, with a deep channel between.

Mid-channel bank lies between Maniacolat and Cacatan islands. Near its northern end and about 2½ miles south-westward of Parangan islet, is a rock awash, one mile southward of which is the northern end of a sand and coral bank, with depths of from 6 to 22 feet ($1^{m}8$ to $6^{m}7$) over it, extending 1½ miles southward.

Bubuan island, 450 feet ($137^{m}2$) high on its western side, is separated from the southern side of Maniacolat island by a channel about 4½ cables wide, in which there is a depth of 21 feet ($6^{m}4$) in the fairway. There is a shallow lagoon in the middle of the island with a narrow entrance on the western side, in which there is a depth of one fathom ($1^{m}8$). The eastern point of the island consists of a steep rocky cliff. The northern part of the island and the valleys between the hills are mostly low, swampy, and covered with mangrove. Coconut groves extend along the eastern and south-eastern shores. Bubuan, the only village, is situated on the shore of the lagoon. A reef of sunken coral extends about one cable from the south-eastern extremity.

Magpeos island, about 4 miles south-south-westward of Bubuan island, and on the southern side of Sugbai passage, is a steep, rocky island with heavily wooded undergrowth, rising in a sharp cone to an elevation of 359 feet ($109^{m}4$). A reef, on which are some rocks, 28 feet ($8^{m}5$) high, and a rock awash at its outer end, extends 1½ cables eastward from the eastern point of the island. Twin pinnacle rocks, the higher of which has an elevation of 14 feet ($4^{m}3$), lies half a cable westward of the south-western extremity of the island.

Tagao island, about 1½ miles southward of Magpeos island, is wooded, and has two hills on its western side, the higher of which has an elevation of 250 feet ($76^{m}2$) to the tops of the trees. The coasts of the island are fringed with coral and coral sand, and are steep on the western and northern sides, but sloping on the eastern and southern sides. A bank, with depths of from one to 5 fathoms ($1^{m}8$ to $9^{m}1$), over it, extends three-quarters of a mile east-south-eastward from the island. A 6-fathom ($11^{m}0$) patch lies 4 cables north-westward of the northern extremity of the island.

Tapaan island is a low island with a large shallow lagoon protected from westward by a barrier reef which is steep-to. A bank with depths of less than 5 fathoms ($9^{m}1$) over it, extends three-quarters of a mile north-north-westward from the northern extremity, one mile southward and about 6 cables eastward from Bulilacat point, the southern extremity of the island. A 28-foot ($8^{m}5$) patch lies at the southern end of a bank, about one mile northward of the island.

Dangers in Tapaan passage.—In the fairway of Tapaan passage, about 4¼ miles north-eastward of Parangan islet, is a shoal with a least depth of 4 fathoms ($7^{m}3$), sand and coral, known as Crest of Wave shoal. It is generally easy to distinguish by the tide-rips in its vicinity, and by the discoloration which is very marked.

A 45-foot ($13^{m}7$) patch lies about 3½ miles north-westward of Bulasan point (*Lat. 5° 29′ N., Long. 120° 43′ E.*), the north-western extremity of Tapaan island.

In the fairway at the southern end of the passage is Tapaan shoal, of coral and sand, with a least depth of 28 feet ($8^{m}5$), lying 4 miles north-eastward of the eastern extremity of Bubuan island.

Charts 2576, 943, 1263.

Chart 928.

Tidal streams.—The general direction of the tidal streams eastward of Tawitawi island is north-west and south-east, although these directions vary somewhat in different passages. The stream, entering Tapaan passage, sets north-north-westward. In the vicinity of Cacatan island and Mid-channel bank the streams set parallel with the channels.

In the passages between the islands westward of Kinapusan island the tidal streams flow parallel with the axes of the channel, but northward of the passages they are deviated westward with the north-going stream. In the area between the Kinapusan islands and Tagao island, (*Lat. 5° 18′ N., Long. 120° 34′ E.*), the streams set west-north-westward and east-south-eastward. The north-west-going stream meets the north-going stream through Tandungan channel at about the parallel of the northern end of Tandungan island.

Eastward of Tawitawi island in the open water areas the tidal streams only occasionally exceed a rate of 2 knots, but in the passages between Tumbagaan and Sugbai islands, those westward of Kinapusan island, and in Tapaan passage the streams may attain a rate of 6 knots.

In unfavourable weather, heavy tide-rips are experienced in the passage between Tumbagaan and Sugbai islands, at the southern entrances to the passages between the Kinapusan islands, in the vicinity of Kinapusan island, and in Sugbai and Tapaan passages. These tide-rips are generally heaviest where the general depths considerably increase or decrease abruptly, as at the southern entrance to the passages between the Kinapusan islands.

TAPUL ISLANDS.—The Tapul islands are a group of four large and several smaller islands lying between Tapaan passage and Jolo island, about 30 miles north-north-eastward. They are rugged, fertile, and well cultivated.

Lapac island.—Lapac (Lapak) island, separated from the north-eastern side of Tapaan island by a channel about 2 miles wide, has two prominent peaks with a deep valley between them, so that at a distance from north-westward it appears as two islands. Mount Lapac, the southern peak, is 1,170 feet ($356^{m}6$) high, and the northern peak has an elevation of 916 feet ($279^{m}2$).

Luangat point, the northern extremity of the island, is rocky and steep-to, and may easily be identified by a small hill close southward of it. Busluc point, half a mile westward of Luangat point, may be easily identified by the large rocks of which it is formed.

A bank, with depths of from 30 to 33 feet ($9^{m}1$ to $10^{m}1$) over it, extends about one mile north-westward from Busluc point.

Pandami island lies close off the north-western side of Lapac island, the channel between them being foul at the northern end. Sirun island, 103 feet ($31^{m}4$) high, and wooded, lies 2½ miles north-westward of the north-western extremity of Lapac island; it is fringed by a reef which extends about 2 cables from the western side.

A rock, which dries 3 feet ($0^{m}9$), lies about 2½ cables from the south-western side of Lapac island, and about three-quarters of a mile westward of Mimul point, the southern extremity of the island.

An extensive reef, which dries one foot ($0^{m}3$), is separated from the south-eastern side of Lapac island by a narrow and foul channel, and extends about 2¾ miles south-south-eastward. Near its southern

Charts 2576, 943, 1263.

Chart 928.

end is Manubul island (*Lat. 5° 28′ N., Long. 120° 48′ E.*), on the northern side of which is a village of the same name.

Anchorage may be obtained by vessels with local knowledge, in depths of from 7 to 12 fathoms ($12^{m}8$ to $21^{m}9$), sand and coral, southward and westward of Pandami island.

Siasi island.—Siasi island is separated from the eastern side of Lapac island by a channel about 3 cables wide. The highest peak of the island is Gorro of Siasi, near the centre, 1,625 feet ($495^{m}3$) high, with a prominent clump of dark trees on its summit. There are several large fishing villages situated on the reefs which fringe the south-western and eastern coasts.

Charts 2576, plan of N. entrance of channel between Lapak and Siasi islands, 928.

Channel between Lapac and Siasi islands.—A depth of 5 fathoms ($9^{m}1$) can be carried by small vessels with local knowledge through the channel between Lapac and Siasi islands. The southern part, which is only about one cable wide in places, lies between the reef extending from the south-eastern side of Lapac island and an extensive reef, which dries from one to 2 feet ($0^{m}3$ to $0^{m}6$), lying between it and the south-western side of Siasi island.

About 2 miles south-westward of Sibatyan point, the northern extremity of Siasi island, is Tolen point, low and wooded, and about 3 cables farther is Busbus point. From the coast between these two latter points a coral reef, which dries, extends a quarter of a mile westward, and a bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends half a mile west-north-westward. A detached shoal, with a depth of 5¼ fathoms ($9^{m}6$) over it, lies about 6½ cables north-westward of Tolen point. A bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends from one to 2½ cables from the western side of Siasi island within a distance of about one mile southward of Busbus point. From Alican (Alikan) point, the north-eastern extremity of Lapac island and the western entrance point of the channel, a spit, with a least depth of 3¾ fathoms ($6^{m}9$) at its outer end, extends about 4 cables northward, and 2 cables north-eastward, leaving a narrow channel, with a depth of 6 fathoms ($11^{m}0$) between it and the bank extending from the eastern shore.

Chart 928.

Dangers in northern approach.—A 34-foot ($10^{m}4$) patch lies about 1¾ miles northward of Sirun island, and a 45-foot ($13^{m}7$) patch about 2¼ miles north-eastward of the same island.

Langon shoal (*Lat. 5° 37′ N., Long. 120° 48′ E.*), with a least depth of 6 fathoms ($11^{m}0$) over it, lies about 3 miles northward of Luangat point.

Sungu shoal, with a depth of 16 feet ($4^{m}9$) over it, lies 2¼ miles north-westward of Sibatyan point.

For shoals farther northward, *see* page 213.

Chart 2576, plan of N. entrance of channel between Lapak and Siasi islands.

Siasi.—The town of Siasi, which stands on the western extremity of Siasi island, is the seat of government of the surrounding island group. There is a small Government wharf, with a depth, in 1937, of 20 feet ($6^{m}1$) alongside its head. There is a prominent radio tower in the town.

Charts 2576, 943, 1263.

Chart 2576, plan of N. entrance of channel between Lapak and Siasi islands.

There is a post office and a police station. Provisions may be obtained, and beef is plentiful if sufficient notice is given.

Anchorage.—Directions.—Vessels may obtain anchorage, in depths of from 6 to 8 fathoms ($11^{m}0$ to $14^{m}6$), in mid-channel south-westward of the wharf at Siasi.

After passing Tolen point vessels should keep in mid-channel to the anchorage. The southern entrance is suitable only for small craft with local knowledge.

Tidal streams.—The tidal streams in the channel between Lapac and Siasi islands attain a maximum rate of 5 knots, setting south and north. During the South-west monsoon, however, the south-going stream is weak, and with strong winds, the direction of the streams varies.

Chart 928.

Northern and eastern sides of Siasi island.—Off-lying dangers.—Tara island, 110 feet ($33^{m}5$) high at its eastern end, is separated from the northern side of Siasi island by a channel about a quarter of a mile wide, with a least depth of 8 fathoms ($14^{m}6$) in the fairway, but in the eastern approach there is a depth of 4 fathoms ($7^{m}3$). On the northern side of the island there is a lagoon, with a depth of 9 fathoms ($16^{m}5$), protected on the north by foul ground, on which lies Tincalan (Tinkalan) islet, 3 feet ($0^{m}9$) high, which, from a distance, resembles a canoe under sail. Close north-westward of the north-eastern point of Tara island is Taratara islet, 124 feet ($37^{m}8$) high.

Bambagan reef, on which there is a rock 2 feet ($0^{m}6$) high, lies about half a mile off the north-eastern side of Siasi island and one mile south-eastward of Tara island. About 2 miles eastward of Bambagan reef is Kadyahan shoal, with a least depth of 13 feet ($4^{m}0$) over it. Between this shoal and the north-east coast of Siasi island south-westward of it there are several shoals, the positions of which may be seen on the chart.

Laminusa island, about one mile north-eastward of the eastern point of Siasi island, is low and covered with mangroves; on the north-western part there is a village and coconut plantation. A reef, which dries, extends about 4 cables from the eastern side of the island, and a bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends three-quarters of a mile farther in the same direction. North Gusun reef, parts of which dry, lies within three-quarters of a mile of the northern side of Laminusa; and Gusun reef, of sand and coral, which dries and which can be usually distinguished, lies about midway between the south-western side of Laminusa and Siasi island. The passage between Gusun reef and Laminusa is clear of dangers but narrow.

Laminusa anchorage, between Laminusa island (*Lat. 5° 33′ N., Long. 120° 55′ E.*) and the reefs extending from the eastern extremity of Siasi island, has depths of from about 6 to 9 fathoms ($11^{m}0$ to $16^{m}5$), sand, and is well sheltered, with good holding ground. The reef on the south-western side of the anchorage partially dries and is steep-to, but it is not easily distinguished and should be approached with caution.

Only vessels with local knowledge should attempt to enter Laminusa anchorage. The tidal streams are very strong at springs, setting westward and northward through the anchorage, and in the reverse direction.

Charts 2576, 943, 1263.

Chart 928.

An extensive reef, on the eastern and southern sides of which are numerous low, thickly wooded, and uninhabited islands, extends about 4 miles eastward from the south-eastern side of Siasi island. On the edge of this reef, where it dries from 4 to 6 feet ($1^{m}2$ to $1^{m}8$), are the following islands, from west to east :—Kansina, Paturuan, Pangana Paturuan (Bulitun), Parangan, Sumbasumba and Patainga. Southward of Basbas point, the southern extremity of Siasi island, the reef extends not more than a quarter of a mile offshore, and is 5 feet ($1^{m}5$) high ; farther eastward the outer edge of the reef is from 2 to 5 feet ($0^{m}6$ to $1^{m}5$) high, and steep-to.

Lugus and Tapul islands.—Off-lying dangers.—Lugus island lies about 4¼ miles northward of Siasi island. Mount Biubugnan, 964 feet ($293^{m}8$) high, and the summit of the island, is covered with tall grass, all the others being wooded to the top. There are several crocodile-infested brackish lakes on the island. An extensive coral reef, which dries, extends about 1¾ miles eastward from the island.

Gondra islet, 112 feet ($34^{m}1$) high, and wooded, lies about 2 cables from the southern side of Lugus island, in a bight near the western end. A 28-foot ($8^{m}5$) patch lies half a mile south-eastward of the islet.

Lugus shoal, with a depth of 13 feet ($4^{m}0$) over it, sand and coral, lies 2¼ miles south-westward of Bolipongpong point, the south-western extremity of Lugus island. A 37-foot ($11^{m}3$) patch lies 1¼ miles west-south-westward of the same point, and another 37-foot ($11^{m}3$) patch lies 6½ miles west-north-westward of the north-western point of the island.

Tapul island is separated from the eastern end of Lugus island by a narrow channel, with a least depth of 19 feet ($5^{m}8$) in the fairway, southward of Tabunan point, the south-western extremity of Tapul island. The tidal streams in this channel attain a maximum rate of 6 knots.

The island rises to Mount Dacut, 1,584 feet ($482^{m}8$) high, and covered with tall grass at its summit, the lower slopes being wooded. Coral reefs fringe the southern end of the island, and a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends about 3½ cables westward from Tabunan point and south-eastward from Lapac point, the south-eastern extremity of the island.

Taluc and Cabingaan islands.—Off-lying dangers.—These low islands lie on the same reef, 3½ miles eastward of Tapul island. Cabingaan (Kabingaan) is almost entirely covered with mangrove. About midway between the two islands is Sibabag, a Moro settlement, built on piles on the reef. A boat passage leads towards the settlement from the eastern side of the reef. There are several clumps of mangrove growing on the reef between the two islands.

Paquia (Pakia) island (*Lat. 5° 41′ N., Long. 121° 00′ E.*) is separated from the western side of Cabingaan island by a deep passage a quarter of a mile wide. At the northern end of the island there is a large Moro cemetery. The outside coast of the island is fringed by coral reefs, which extend from a quarter to one cable offshore. A spit, with depths of less than 5 fathoms ($9^{m}1$) over it, and with 10 feet ($3^{m}0$) at its outer extremity, extends about 1½ miles south-south-eastward from the island.

A bank, with a least depth of 7 fathoms ($12^{m}8$) over it, at its southern end, lies about midway between the southern end of Tapul island and

Charts 2576, 943, 1263.

Chart 928.

Paquia island. A bank, with a least depth of 45 feet (13^{m}7) over it at its south-eastern end, lies about 2¼ miles north-north-eastward of Taluc (Taluk) island. A 28-foot (8^{m}5) patch lies half a mile eastward of the eastern extremity of Cabingaan island, and a bank, with a least depth of 40 feet (12^{m}2) over it, lies about 2¾ miles north-eastward of the same point.

JOLO ISLAND.—Jolo (Holo) island, the largest of the Jolo group, consists of a series of hills and valleys from west to east, the highest peak of the island being Mount Tumatangas, 2,664 feet (812^{m}0) high, situated about 6 miles north-eastward of Silangon point, the western extremity. The coasts, especially the northern, are mostly wooded, clear of dangers and steep-to, as are also the off-lying islands and islets. The coasts are slightly indented, forming several bays where anchorage may be obtained, the most sheltered and secure in both monsoons being that of Dalrymple harbour, situated on the northern side of the island, near the eastern end. The mountains are covered with trees or grass, and some are cultivated to the summit. *See* view facing page 204.

The edge of the bank on which the Sulu archipelago lies is close to the south-eastern coast of Jolo island and tide-rips are usually found in the vicinity of any abrupt changes in depth.

Tidal streams.—The tidal streams follow the direction of the coast, and attain a rate of 5 knots in the narrower channels.

SOUTHERN SIDE OF JOLO ISLAND.—Coast.—Bunga point (*Lat. 5° 55′ N., Long. 120° 53′ E.*), about 2 miles southward of Silangon point, is fringed by a coral reef which extends a short distance offshore. A 3-fathom (5^{m}5) patch lies about half a mile westward of the point. Parang island lies on a bank, with depths of less than 3 fathoms (5^{m}5) over it, which extends about 4 cables offshore at about 4 cables south-eastward of Bunga point.

Parang, about 1¾ miles east-south-eastward of Bunga point, is a typical Moro town built on piles over the water; it is the largest town on the south coast of Jolo and is the business centre of the most populous section of the island.

Anchorage may be obtained by vessels with local knowledge, in a depth of 9 fathoms (16^{m}5), coral and sand, about 3¾ cables offshore with a large storehouse with a galvanised iron roof, at Parang, bearing 010°, and Tubingantan point, situated 3¼ miles south-eastward of Bunga point, bearing 130°.

Off-lying island.—Sulade island, about 6¾ miles south-westward of Bunga point, consists of a coral and sand ridge surrounding a shallow lagoon with an entrance on the southern side through which boats can pass at high water. The island is swampy and is 40 feet (12^{m}2) high to the tops of the trees. A bank, with depths of less than 10 fathoms (18^{m}3) over it, extends about 1½ miles from the northern side and 2¼ miles from the south-western side of the island. Anchorage may be obtained by vessels with local knowledge, in depths of from 6 to 9 fathoms (11^{m}0 to 16^{m}5), coral sand, over the bank extending from the western side of the island.

The tidal streams between Sulade and Jolo islands attain a rate of 5 knots, setting north-westward, and south-eastward.

Charts 2576, 943, 1263.

Chart 927, plan of Maimbung bay.

Maimbung bay.—Dangers.—Maimbung bay, entered between Cabalian (Kabalian) point, situated about a mile eastward of Tubingantan point, and Putic (Putik) point (*Lat. 5° 53′ N., Long. 121° 04′ E.*), 8¼ miles farther eastward, affords good shelter during the North-east monsoon, but is exposed to a heavy swell during the South-west monsoon. At the head of the bay are the river and town of Maimbung. The shores of the bay are fringed by a narrow coral reef, and there is a depth of 5 fathoms ($9^{m}1$) about 2 cables offshore. The eastern side is covered by mangroves; the western shore is wooded with cleared spaces. Mount Talipao, 1,512 feet ($460^{m}9$) high, lies 3 miles east-north-eastward of the town.

The town of Maimbung is built on piles on the outer edge of the bar at the mouth of the river of the same name, which has a depth of one foot ($0^{m}3$) over it.

Batolaqui (Batolaki) bank comprises a number of shoal patches lying within about 1¼ miles eastward and south-eastward of Cabalian point. On the bank there are depths of from 1¾ to 5 fathoms ($3^{m}2$ to $9^{m}1$), with a rock, which dries, on the western edge. Between the north-western side of the bank and the coast of Jolo there is a narrow channel with a least depth in the fairway of 6¼ fathoms ($11^{m}4$).

Bunga point, bearing 309°, open south-westward of Tubingantan point, leads south-westward of Batolaqui bank.

Within the bay and fronting the town are several shoals, the outermost of which is a 1½-fathom ($2^{m}7$) patch, lying about 1½ miles from the head of the bay. About 4 cables north-eastward of this patch is Marban bank, with a depth of 6 feet ($1^{m}8$) over it, and half a mile north-north-westward is a shoal named Dry bank, which dries 2 feet ($0^{m}6$). Between Dry bank and the head of the bay is another shoal, which dries 2 feet ($0^{m}6$). A 2¼-fathom ($4^{m}1$) patch lies 2 cables north-north-westward of the northern extremity of Dry bank. Two shoals, with depths of 4¾ and 5 fathoms ($8^{m}7$ and $9^{m}1$) over them, lie 5½ cables eastward and 6 cables east-north-eastward, respectively, of the eastern edge of Dry bank.

Anchorages.—Directions.—Vessels may obtain anchorage anywhere in Maimbung bay, but the usual anchorage is about half a mile southward of the town, in depths of 8 or 9 fathoms ($14^{m}6$ or $16^{m}5$), coral sand, with the middle of Dry bank bearing about 232°. Smaller craft may anchor a little closer inshore directly off the mouth of the river, in a depth of 7 fathoms ($12^{m}8$), mud and sand.

There are two channels leading to the anchorage off the town. The eastern, between Marban bank and the eastern shore of the bay, and the western, between Marban and Dry banks. The former and better channel is about 4 cables wide, with a least depth of 5 fathoms ($9^{m}1$); vessels approaching it from south-eastward, after passing Patian island, situated about 1¼ miles south-south-eastward of Putic point (*Lat. 5° 53′ N., Long. 121° 05′ E.*), should steer for Mount Matatal, 464 feet ($141^{m}4$) high, situated about 1½ miles north-north-westward of the town, bearing 340°, which will lead to the anchorage. Only vessels with local knowledge should use the western channel.

Tidal streams.—Inside the shoals in Maimbung bay there is no appreciable tidal stream, but in the offing they are strong and irregular. The streams set westward and eastward, and change from half an hour to 2 hours after the time of high and low water by the shore.

Charts 928, 2576, 943, 1263.

Chart 927, plan of Maimbung bay.

Off-lying islands and dangers.—Teomabal island, 3½ miles south-westward of Putic point, is low and fringed by a coral reef which extends about 2 cables from the south-eastern side. The greater part of the interior of the island consists of a large lagoon which nearly dries and is entered through the fringing reef on the north-eastern side. A bank, with depths of from 3¾ to 5 fathoms ($6^{m}9$ to $9^{m}1$) over it, and over which there are tide-rips, extends 2¼ miles south-eastward from the island. A 4¾-fathom ($8^{m}7$) patch lies 6½ cables north-eastward of the eastern extremity of the island.

Chart 928.

Patian and Lumbian islands lie about 2¾ and 4 miles eastward, respectively, of Teomabal island, and are generally steep-to at a short distance. Anchorage may be obtained by vessels with local knowledge in the channel between Patian and Lumbian islands, in depths of from 9 to 10 fathoms ($16^{m}5$ to $18^{m}3$). Garcia shoal, with a depth of 21 feet ($6^{m}4$) over it, lies a quarter of a mile south-westward of Lumbian island.

Chart 927, plan of Maimbung bay.

Villamil rock, over which there is a depth of 4 feet ($1^{m}2$), lies about three-quarters of a mile southward of Putic point; the rock is steep-to.

Chart 928.

Tutu bay.—Tutu bay, entered between Putic point and Karangdato point, about 12¾ miles eastward, is separated from a bay on the northern side of Jolo island by a low isthmus about 2¾ miles wide. A narrow reef fringes the western shore of the bay, but from the northern shore and also the north-eastern shore, between Karangdato point and Tanun point, about 3 miles north-westward, the reef extends off one mile. The bay is sheltered from southerly winds by Pata island.

Serantes shoal (*Lat. 5° 54′ N., Long. 121° 07′ E.*), with a least depth of 9 feet ($2^{m}7$) over it, lies about 6 cables from the western shore of the bay and about 2¾ miles north-eastward of Putic point. A shoal, with a least depth of 12 feet ($3^{m}7$) over it, lies in the middle of a small bay north-eastward of Mabajoc (Mabajok) point, situated 4¼ miles north-eastward of Putic point. The bay northward of Tutu point is encumbered with shoals and reefs.

There are several settlements and villages on the shores of Tutu bay. Kulaykulay, at the head of the bay, and Karungdung, 2¼ miles north-north-westward of Karangdato point, are connected by good roads with the north coast and with Jolo.

Anchorage may be obtained by vessels with local knowledge anywhere in Tutu bay clear of the shore reefs, and small craft might find anchorage inside the outer reefs in the bay northward of Tutu point, but the fringing reef in this bay extends as much as 6 cables offshore in places. The best landing appears to be at Pandanpandan, just northward of Tutu point, situated 4¼ miles north-westward of Karangdato point.

Off-lying islands and dangers.—Pata island, 1,385 feet ($422^{m}1$) high, lies about 4½ miles south-eastward of Putic point. The higher parts of the island are covered with tall grass, the lower slopes are wooded, with some patches of cultivated ground. The island is clear of off-lying dangers and is steep-to outside the coastal reef. The southern side is fringed by a coral reef which extends about a quarter of a mile

Charts 2576, 943, 1263.

Chart 928.

offshore, and from the eastern side it extends about 2¼ miles and surrounds Kamawi island, which is separated from Pata island by a narrow channel through the mangrove. Tanquique rock, 4 feet ($1^{m}2$) high, lies on the edge of the coastal reef southward of the southern extremity of Kamawi island.

Damocan (Damokan) island, about 136 feet ($41^{m}4$) high to the tops of the trees, is separated from the north-western side of Pata island by a deep, clear channel, about half a mile wide.

Dongdong island is separated from the north-eastern side of Pata island by a deep channel about half a mile wide between the shoals on either side, and clear of dangers. The island is low, with reefs fringing the mangrove on the northern and eastern sides. The reef extends about 4 cables from the south-eastern end of the island. On the south-western side of the island is a sandy beach, and this part is planted with coconut trees.

Tambulian island, about three-quarters of a mile north-north-westward of Dongdong island, is fringed by a coral reef which dries, extending 4 cables from the south-eastern side. The navigable channel between the two islands is about 3 cables wide with a depth of 9 fathoms ($16^{m}5$) in the middle.

Tidal streams.—The tidal streams attain a rate of 2½ knots between Pata and Taluc islands, setting north-westward, and south-eastward. Between Pata and Dongdong islands the streams set in a similar direction and attain a rate of 3 knots.

Coast.—Pitogo bay, entered between Karangdato point and Tandican (Tandikan) point, about 6 miles north-eastward, is open to the southward and has considerable depths. The shore is fringed by a coral reef, which extends about 3 cables offshore in places. A break in the reef, about 2½ miles north-eastward of Karangdato point, affords a landing for boats. The bay northward of Tandican point is filled with coral reefs which dry. Tandu peak, 1,312 feet ($399^{m}9$) high, and Mount Baybay, 1,275 feet ($388^{m}6$) high, about 6 cables north-north-westward of it, lie about 1¼ miles within the eastern extremity of Jolo island.

WESTERN AND NORTHERN SIDES OF JOLO ISLAND.—

Coast.—Islets.—Dangers.—Between Silangon point (page 214) and Belan point (*Lat. 6° 03′ N., Long. 120° 59′ E.*), 9¼ miles north-eastward, the coast is fringed with a steep-to coral reef, and the land rises in wooded slopes to Mount Tumatangas.

Matos shoal, with a depth of 4 fathoms ($7^{m}3$) over it, lies about 1½ miles northward of Silangon point and about 6 cables offshore.

Tulian islet, 113 feet ($34^{m}4$) high, and cultivated, lies about 1¼ miles north-westward of Pulaluaac (Pulaluaak) point, situated 3½ miles north-north-eastward of Silangon point. The channel between Tulian islet and the coast of Jolo is clear of dangers and deep on the western side, but depths of less than 5 fathoms ($9^{m}1$) extend half a mile off the coast of Jolo.

Busson rock, awash, and very steep-to on its western side, lies a quarter of a mile north-westward of Tulian islet.

Buansa shoal, with a depth of 25 feet ($7^{m}6$) near its outer end, extends about three-quarters of a mile offshore, at about 2 miles westward of Belan point.

Charts 2576, 943, 1263.

Chart 928.

Tidal streams.—Off the north coast of Jolo the streams set westward and eastward at a rate of about 2 knots. Off the town of Jolo the direction is somewhat modified by the coast, setting south-westward and north-eastward.

Islands and dangers in northern approach to Jolo anchorage.—Pantocunan (Pantokunan) island, about 52 feet ($15^{m}8$) high to the tops of the trees, lies about 12½ miles north-north-westward of Jolo lighthouse. The island is fringed by a coral reef, with some rocks which dry on it, extending 2 cables offshore in places; the edge of the reef at a short distance is steep-to.

Cabucan (Kabukan), Lahatlahat, Bubuan, Tauitaui, Hegad, and Minis islands are all low, with mangrove swamps, and are fringed with a barrier reef. The position of the larger of these islands may be seen on the chart. Lahatlahat, situated between Cabucan and Bubuan, is fringed by a reef and a bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extending about 8 cables north-north-westward from it. Tauitaui lies about half a mile south-eastward of the southern extremity of Bubuan. A spit, with depths of less than 5 fathoms ($9^{m}1$) over it, extends about 3½ cables eastward and a spit, with depths of less than 6 feet ($1^{m}8$) over it, extends 1½ cables south-westward from the island.

Close off the north-eastern point of Cabucan island is Palliagan, a small wooded island lying on the same reef. There is a hill, 291 feet ($88^{m}7$) high, at the northern extremity of Bubuan island; the other islands of the group are from 40 to 50 feet ($12^{m}2$ to $15^{m}2$) high to the tops of the trees. Cabucan and Bubuan islands are inhabited.

Between Bubuan and Lahatlahat islands is Concas reef, with a least depth of 2 fathoms ($3^{m}7$) over it, with a narrow channel on either side of it, in which there are depths of from 7 to 10 fathoms ($12^{m}8$ to $18^{m}3$), but in the southern entrance to the western of these channels there is a 5-fathom ($9^{m}1$) patch. There is also a narrow channel between Lahatlahat and the north-eastern side of Cabucan island. A reef, with a depth of 27 feet ($8^{m}2$) over it, lies about 6 cables north-westward of the northern point of Bubuan island.

Aguirre bank, with a least depth of 25 feet ($7^{m}6$) over it, lies 2¼ miles west-south-westward of the western extremity of Cabucan island; the north-western and western edges of the bank are very steep-to.

Marongas island, 210 feet ($64^{m}0$) high, at its western extremity, lies 3½ miles north-north-westward of Jolo lighthouse. The rest of the island is low, and a mangrove-bordered lagoon almost divides the island into two.

Pangasinan island (*Lat. 6° 08′ N., Long. 120° 59′ E.*), about 4 cables north-eastward of Marongas island, is almost entirely covered with mangrove. A hill, 405 feet ($123^{m}4$) high, rises above the mangrove near the southern central part of the island. The southern and western coasts are fringed with sand; the greater part of the northern side consists of mangrove. In the channel between Marongas and Pangasinan islands there are depths of from 6 to 12 fathoms ($11^{m}0$ to $21^{m}9$) in the fairway. A shoal, with a least depth of 21 feet ($6^{m}4$) over it, lies about three-quarters of a mile north-eastward of the eastern extremity of Pangasinan island.

Anchorage may be obtained by vessels with local knowledge, in

Charts 2576, 943, 1263.

Chart 928.

depths of from 6 to 12 fathoms ($11^{m}0$ to $21^{m}9$), about one cable from the coasts of these two islands, but the tidal streams are strong.

Chart 927, plan of Holo anchorage.

Jolo anchorage.—Jolo (Holo) anchorage, situated north-eastward of Belan point, is open to the northward and westward, and as the coastal bank is steep and the tidal streams are strong, it is not a good anchorage. During the North-east monsoon vessels are sometimes obliged to take shelter under the lee of Marongas island.

The usual anchorage for vessels which do not intend to proceed alongside the wharf is north-westward of the lighthouse, in depths of from 12 to 14 fathoms ($21^{m}9$ to $25^{m}6$).

Jolo.—Light.—The town of Jolo (Holo), situated in a bight about half a mile eastward of Belan point, is a port of entry open to foreign shipping and the principal town in the island. It is well laid out and surrounded by a wall. The Chinese town is built on a long pier about 1¼ cables westward of the town proper. The principal exports are hemp, copra, and a variety of hardwoods; the principal imports are rice, hardware, and cotton goods.

A stone mole extends about one cable north-westward from the northern gate of the town, with a concrete extension, at the head of which, in 1948, there was a depth of 27 feet ($8^{m}2$), but on either side reefs extend, so that caution is necessary when going alongside; it should be approached from south-westward. Water may be obtained alongside the pier.

A light is exhibited, at an elevation of 58 feet ($17^{m}7$), from a white iron framework tower, on the north-eastern side of the head of the stone mole.

Communication.—Radio station.—There is regular steamer communication with all ports in the Philippine islands, and occasional communication with Borneo and Singapore.

There is a radio station at Jolo. *See* page 14.

Harbour facilities.—A few provisions may be obtained. Small repairs to vessels can be effected.

Climatic table.—*See* page 31.

Chart 928.

Coast. — Islets. — Dangers. — Between Daingapic (Daingapik) point, situated about 2½ miles north-north-eastward of Belan point, and Igasan point, 8½ miles eastward of the former point, the coast is steep-to and fringed with coral; the land is sparsely wooded and rises gradually to the mountains in the interior. Mount Bahu, 2,590 feet ($789^{m}4$) high, and Mount Daho, 2,247 feet ($684^{m}9$), lying 4 and 7 miles, respectively, south-westward of Igasan point (*Lat. 6° 05′ N., Long. 121° 09′ E.*), are the highest peaks in this part of Jolo. *See* view facing page 204.

Bancungan (Bankungan) island, about half a mile eastward of Igasan point, is 508 feet ($154^{m}8$) high, and wooded, but the southern slopes are clear. A rock, 20 feet ($6^{m}1$) high, lies near the outer end of a spit which extends about a quarter of a mile from the north-western point of the island. The remainder of the island is steep-to; in the channel between the island and the coast of Jolo there are depths of from 16 to 18 fathoms ($29^{m}3$ to $32^{m}9$).

Panganaa islet which is wooded, steep and rocky, lies about one mile east-south-eastward of Bancungan island; it is uninhabited. A small flat rock of reddish colour lies close off the eastern side of the islet.

Charts 2576, 943, 1263.

Chart 928.

Between Igasan point and Baverstock point, 10 miles east-south-eastward, there is a deep, open bay, the shores of which are composed of sand and coral beaches with an occasional stretch of mangrove. There are several villages along the shores of this bay, but all trade passes through the town of Jolo.

Eseo bank, with a least depth of 15 feet (4^m6) over it, lies about one mile offshore northward of Caduayan (Kaduayan) village, situated at the head of the bay, and a shoal, with a depth of 10 feet (3^m0) over it, lies half a mile offshore between Eseo bank and the village. A shoal, with a depth of 19 feet (5^m8) over it, lies about 6 cables north-westward of Eseo bank.

Off-lying island.—Gujangan (Guhangan) island, 5¼ miles eastward of Bancungan island, has two wooded hills, 400 and 265 feet (121^m9 and 80^m8) high, with a narrow strip of low land between them, and when seen at a distance appears as two islands, the higher at the northern end. The island is steep-to, except on the eastern side, where there is an extensive coral reef which dries. The island is inhabited.

Chart 927, plan of Dalrymple harbour and Kapual channel.

Dalrymple harbour.—Dalrymple harbour is formed by Tulayan island and the coast of Jolo. Tulayan island, about 6½ cables north-eastward of Baverstock point, has a cone-shaped peak, 527 feet (160^m6) high, which is a good landmark when approaching from northward and eastward. Much of the slope has been cleared of trees and is cultivated. On the eastern and southern coasts there is a sandy beach; the western and northern sides are steep and rocky.

Tandu Bato, a village about 3 cables southward of Baverstock point, is connected with the town of Jolo by a good road. Petley point, 2¼ miles eastward of Baverstock point, is fringed by mangrove, and fronted by a coral reef which dries.

Patotol bay is a landlocked bight entered about 1¼ miles east-south-eastward of Petley point. The shores are fringed with mangrove and a mud flat extends from the head. The entrance is narrow and tortuous between reefs on either side. Vessels with local knowledge may obtain anchorage just inside the entrance, in depths of from 5 to 6 fathoms (9^m1 to 11^m0), mud. Depths of less than 3 fathoms (5^m5) extend about 4 cables from the head of the bay.

Bulicutin island (*Lat. 6° 01′ N., Long. 121° 22′ E.*), low and swampy, with a coconut grove at the eastern end, fronts the entrance to Patotol bay. A depth of 2½ fathoms (4^m6) may be carried through the channel westward of the island. The eastern channel is deeper but is encumbered by several shoals and coral rocks. The tidal stream through these channels attains a maximum rate of 2½ knots.

Between Tulayan island and the southern shore of the harbour are several shoals, with depths of from 1¾ to 3 fathoms (3^m2 to 5^m5) over them, the positions of which may best be seen on the chart. White passage, the western entrance to the harbour, is contracted by a bank extending northward from Baverstock point and is encumbered with several shoal patches. The eastern entrance is known as Gray entrance.

Anchorage.—Directions.—The best anchorage in Dalrymple harbour is south-eastward of Tulayan island, in depths of from 8 to 9 fathoms (14^m6 to 16^m5), coral sand, but it is exposed to the north-east. During strong north-easterly winds better protection may be

Charts 2576, 943, 1263.

Chart 927, plan of Dalrymple harbour and Kapual channel.

obtained under the lee of Tulayan island, though the wind seldom blows home during this monsoon.

A deep draught vessel approaching Dalrymple harbour from westward, should, after rounding the northern end of Tulayan island, steer 180°, passing about half a mile eastward of the island to avoid a 3-fathom ($5^{m}5$) patch lying a quarter of a mile south-eastward of Martin bluff, on the eastern side of the island. When Balseiro point, the southern extremity of Tulayan island, bears 270° she should steer for it on that bearing and anchor with Martin bluff bearing between 000° and 030°, in depths of from 8 to 9 fathoms ($14^{m}6$ to $16^{m}5$), sand.

If entering by White passage the vessel should keep a quarter of a mile from the western and southern sides of Tulayan island, and anchor as directed above. Smaller vessels can go closer to the Jolo coast.

Charts 927, plan of Dalrymple harbour and Kapual channel, 928.

Eastern approach to Dalrymple harbour.—Capual (Kapual) island, 976 feet ($297^{m}5$) high at the south-eastern extremity, is separated from the eastern end of the northern side of Jolo island by Capual (Kapual) channel. The northern and western parts of the island are low and wooded. The coast is mostly fringed by a sandy beach interspersed with coral ledges. A narrow coral ledge extends about 4 cables northward from the north-western point, with a depth of 10 feet ($3^{m}0$) over its outer end.

Capual channel has a least width of about 2¾ cables and is deep at the eastern end, but the western end has only a very narrow passage with a depth of 3¼ fathoms ($5^{m}9$) between the shoals which extend from either side. The bottom is coral and sand, and the tidal streams are strong. Anchorage may be obtained anywhere in the channel off the southern side of Capual island, but the area northward of the village of Liangliang, near the western end of the channel, appears to afford the best protection.

Goitya shoal, with a least depth of 9 feet ($2^{m}7$) over it, coral, lies about 1¼ miles northward of the western extremity of Capual island, with a deep channel between it and the island. A 3-fathom ($5^{m}5$) patch lies about 3½ cables north-eastward, and a 28-foot ($8^{m}5$) patch lies 5½ cables south-westward of Goitya shoal.

Chart 928.

Bitinan island (*Lat. 6° 04′ N., Long. 121° 27′ E.*), separated from the north-eastern side of Capual island by a deep, clear channel, about one mile wide, rises to a steeply wooded hill, 705 feet ($214^{m}9$) high at its southern extremity; the northern part of the island is low.

SAMALES GROUP.—The Samales group of islands lie on a bank which extends about 25 miles north-eastward from a position about 4½ miles eastward of Jolo island. They are sparsely inhabited by Moros, who live principally by fishing. A small amount of copra and a few mats are the only articles of trade.

Manungut island, 263 feet ($80^{m}2$) high, lies 3¼ miles east-south-eastward of Bitinan island, and is the westernmost of the group.

Bangalao island, about 1¼ miles south-eastward of Manungut island, is low. There are two inlets bordered by mangrove on the eastern side of the island, and on the western side is the village of Bangalao. A reef extends about half a mile northward, prolonged by a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extending 1¼ miles

Charts 2576, 943, 1263.

Chart 928.

farther in the same direction, and a spit, with depths of less than 5 fathoms (9^{m}1) over it, extends about one mile south-westward from the island.

Simisa island, about 2¾ miles south-eastward of Bangalao island, is low ; on its north-western side is a shallow inlet bordered by mangrove. On the south-eastern side of the island there is a steep-to, coral and sand beach.

Sipac (Sipak), Balanguingui, and Dawildawil islands and several unnamed islands lie close together, being separated only by shallow lagoons. Sipac island, the southernmost of this group, lies about 4 miles north-eastward of Simisa island. Bunotpasil island, low and bordered by mangrove, lies close north-westward of the group, from which it is separated by a deep narrow channel.

Suligan shoal, with a least depth of 19 feet (5^{m}8) over it, lies in the channel between Simisa and Sipac islands, about 1¾ miles westward of Bulitalun point, the western extremity of Sipac island.

Mamanoc (Mamanok) island, about 1½ miles north-north-westward of the group described above, is low and fringed with a coral reef which extends 1½ cables from a sandy beach on the south-eastern side ; the western side is fringed with mangrove. A spit, with a depth of 25 feet (7^{m}6) over its outer end, extends about half a mile southward from the island. Parol island, about one mile north-eastward of the same group, is low and planted with coconut trees. It is mostly fringed by a coral reef, which extends 3 cables from the north-western extremity and about 2½ cables from the south-eastern extremity of the island, and a bank, with depths of less than 5 fathoms (9^{m}1) over it, extends about one mile and three-quarters of a mile from these extremities, respectively. On the south-western side, near the village of Parol, there is a sandy beach which is steep-to, but there is a 16-foot (4^{m}9) patch lying a quarter of a mile offshore at this place. At the north-western end of the channel between Parol island and the group south-westward of it are several shoal heads with depths of from 21 to 30 feet (6^{m}4 to 9^{m}1) over them.

Tongquil island.—Tongquil (Tonkil) island, the largest of the Samales group, is low, flat, and densely wooded. The south-western side is fringed by a barrier reef with several narrow entrances to a shallow lagoon ; the south-eastern side is composed of broken coral and sand, with trees extending down to the water's edge. Between Po Estero on the west and Eguet point (*Lat. 6° 03′ N., Long. 121° 57′ E.*), the north-eastern extremity of the island, on the east, the southern coast is steep-to, the 100-fathom (182^{m}9) line coming within a quarter of a mile of it.

Sagui point, the northern extremity of the island, is low and fringed by a coral reef which extends about a quarter of a mile offshore. The northern side of the island is fringed by a coral reef, which, in the middle part of the island, dries and extends about one mile offshore ; a bank, with depths of less than 18 feet (5^{m}5) over it, lies within 2¾ miles of the middle of the northern side of the island and there are depths of from 18 to 30 feet (5^{m}5 to 9^{m}1) between the north-western end of Tongquil island and Bulan island. Gumila reef, which dries, lies about one mile offshore, and 4¾ miles westward of Eguet point. Between this reef and Eguet point are Culatculat and Bulisulat reefs, lying close offshore, separated from the coastal reef by deep channels.

Charts 2576, 943, 1263.

Chart 928.

Eastward and northward of Gumila reef is a considerable area with little or no tidal streams, affording the best anchorage for vessels with local knowledge within the Samales group.

Islands and dangers northward of Tongquil island.—Light.— Bulan island lies 3¼ miles north-eastward of Sagui point. Bulan peak, near the middle of the island, is 1,110 feet ($338^{m}3$) high. The coast is low and flat, with the exception of the north-eastern point, where it rises as a black rock, 220 feet ($67^{m}1$) high. A 28-foot ($8^{m}5$) patch lies about three-quarters of a mile southward of the island, and a 27-foot ($8^{m}2$) patch lies 1¾ miles south-eastward.

Bucutua (Bukutua) island, 365 feet ($111^{m}2$) high, and heavily wooded, is separated from Bulan island by Ton Sandungun channel. The eastern coast of the island is clear of dangers and has a sandy beach, but there are some shoal patches, with depths of from 19 to 36 feet ($5^{m}8$ to $11^{m}0$) over them, lying from one to 1¼ miles off it. A bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends about 3 cables from the western side, and half a mile westward of the central part of the west coast is Butakalut shoal, with a depth of 16 feet ($4^{m}9$) over it.

Ton Sandungun channel is a narrow passage, with a least depth of 3 feet ($0^{m}9$) just inside the south-western end. Both shores are bordered with mangrove, the bottom is coral with many coral shoals, and there is practically no tidal stream. The channel affords good protection for small craft with local knowledge; a depth of 7 feet ($2^{m}1$) can be carried through the north-eastern entrance, and anchorage obtained well inside the entrance points. Fair anchorage may be obtained by vessels with local knowledge off the north-eastern entrance, in depths of from 8 to 10 fathoms ($14^{m}6$ to $18^{m}3$), loose coral and sand. This anchorage is well out of the strong tidal streams which set amongst these islands, and is the best in the vicinity.

Dipolod and Little Dipolod islets lie about 1¼ miles off the north-eastern side of Bulan island; they are both wooded, Dipolod being 226 feet ($68^{m}9$) high, and Little Dipolod, 138 feet ($42^{m}1$). A 25-foot ($7^{m}6$) patch lies a quarter of a mile westward of Dipolod islet.

Mamad island (*Lat. 6° 09′ N., Long. 121° 46′ E.*), 108 feet ($32^{m}9$) high, lies about 1¾ miles westward of the southern part of Bucutua island; the lower slopes are covered with coconut trees, and the higher part is wooded. Two 28-foot ($8^{m}5$) patches lie 2¾ cables north-eastward and 4 cables east-south-eastward, respectively, of Mamad island. A bank, with a depth of 27 feet ($8^{m}2$) at its outer end, extends about 1½ cables from the southern side of the island.

Tatalan island, 353 feet ($107^{m}6$) high, and heavily wooded, lies about 2¾ miles north-north-eastward of Bucutua island. The channel between them is deep and clear of dangers in the fairway and is generally used by vessels coming from south-eastern Mindanao ports. A bank, with depths of from 28 to 45 feet ($8^{m}5$ to $13^{m}7$) over it, extends 2 miles south-eastward from the eastern side of Tatalan island, and a 40-foot ($12^{m}2$) patch lies 3¾ miles eastward of the island. A bank, with a least depth of 45 feet ($13^{m}7$) over it, lies about 5½ miles north-westward of the island.

Mandi rock, 4 feet ($1^{m}2$) high, and fairly steep-to, lies 2 miles westward of the northern extremity of Tatalan island.

Charts 2576, 943, 1263.

Chart 928.

A light is exhibited, at an elevation of 45 feet (13^m7), from a white concrete tower, at the southern extremity of Tatalan island.

Bolod islands, consisting of two heavily wooded islands, lie about 19 miles north-north-eastward of the eastern end of Jolo island. West Bolod is steep-to except on its southern side and is 499 feet (152^m1) high. A bank, with a depth of 22 feet (6^m7) over it, extends about one cable from the southern side of the island. East Bolod, about 1¼ miles north-eastward of West Bolod, is 520 feet (158^m5) high, with a peculiar dome-shaped summit. The channel between the two islands is deep and clear of dangers.

A spit, with a depth of 13 feet (4^m0) over it, extends about 3 cables northward from East Bolod island, and Tirana rock, 3 feet (0^m9) high, lies half a mile northward of the same island; this rock is steep-to and the sea seldom breaks in its vicinity. A bank, over which there are depths of from 18 to 30 feet (5^m5 to 9^m1), lies from about 4 cables to 1¼ miles south-eastward of East Bolod island.

Sibarut bank, with a least depth of 40 feet (12^m2) over it, sand and rock, lies 5 miles south-westward of West Bolod island.

Sungu shoal (*Lat. 6° 13′ N., Long. 121° 41′ E.*), about 4¼ miles south-eastward of East Bolod island, has a least depth of 6 feet (1^m8) over it; it lies on the south-western edge of a bank of loose coral and sand, with some coral rocks on it. Two coral patches, with depths of 27 and 28 feet (8^m2 and 8^m5) over them, lie 8½ cables east-north-eastward and 6 cables eastward, respectively, of Sungu shoal. Strong tide-rips are nearly always experienced in the vicinity.

Tidal streams.—The tidal streams in the channels between the islands of the Samales group are strong; a rate of 3 knots has been observed between the north-western extremity of Tongquil island and Mamad island. The streams turn from half an hour to 2 hours after high and low water. Overfalls and tide-rips, dangerous to small boats, may be expected near shoals and where there is a decided change in depth. Ton Sandungun channel (page 223) is an exception to the foregoing.

Outlying danger.—A rock, the existence of which is doubtful, is charted 34 miles southward of Eguet point (*Lat. 6° 03′ N., Long. 121° 57′ E.*), Tongquil island.

TAPIANTANA GROUP.—Dangers.—This group lies between the Samales group and the southern side of Basilan island. The principal islands are Bubuan, Linawan, Tapiantana, and Saluping. The two latter have extensive coral reefs extending from their eastern sides, with several smaller islands on them. All four of the islands are comparatively steep-to on the north and west, and there are depths of over 100 fathoms (182^m9) close to the southern side of the group. The depths westward of the group are irregular, but no dangers have been found.

Tapiantana island lies 7½ miles north-eastward of Tatalan island. The eastern part of the island is a mangrove swamp from which the coral reef extends about 1½ miles eastward. The western part is well cultivated, though there are some heavily wooded areas on the slope of Mount Bancaobancao, which is 892 feet (271^m9) high, with a flat summit, cleared of trees. Tolonpisa island is a narrow sand and coral spit marking the southern edge of the reef; the northern side is fringed

Charts 2576, 943, 1263.

Chart 928.

with mangrove which almost joins that extending south-eastward from Tapiantana island. Haluluko islet, consisting of mangrove, lies on the reef close off the north-eastern side of Tapiantana island, and a small spit of broken coral and sand marks the north-eastern edge of the reef.

Linawan island, 396 feet ($120^{m}7$) high, lies about 1½ miles westward of the northern part of Tapiantana island. A coral reef extends about 1½ cables from the southern side of the island, and a bank, with depths of from 15 to 45 feet ($4^{m}6$ to $13^{m}7$) over it, extends 1¼ miles south-south-eastward. There are some rocky ledges extending from the north-western side, and the remainder of the coast line is fringed by a sandy beach. There are three small villages on the eastern side of the island. The eastern and southern parts of the island are cultivated, and the western slopes of the hills are heavily wooded.

Pababat shoal, a bank of white coral sand, with a least depth of 8 fathoms ($14^{m}6$) over it, lies 3 miles west-south-westward of Linawan island.

Bubuan island, 1¼ miles northward of Tapiantana island, is fringed by a coral reef, which extends about half a mile eastward from the south-eastern side. Bolodbolod point, the western extremity, is rocky, being the only part of the island entirely free from coral; the eastern and southern parts of the island consist of extensive mangrove swamps. Mount Bulutbulibato, 786 feet ($239^{m}6$) high, is mostly heavily wooded. The island is inhabited.

Balas shoal, with a depth of 6 feet ($1^{m}8$) over it, lies half a mile southward of the south-eastern side of Bubuan island, on a bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extending about one mile westward, and about 1¼ miles eastward from the shoal.

Saluping and Timbungan islands lie on an extensive coral reef about 2 miles eastward of Bubuan island. A chain of disconnected coral islets lies on the outer edge of the reef. Saluping island is low, flat, and cultivated; a mangrove swamp occupies the south-eastern part of the island. Timbungan island is a coral and sand ridge with mangrove on the inshore side.

Anchorages.—Anchorage may be obtained by vessels with local knowledge, about three-quarters of a mile northward of the western end of Tapiantana island (*Lat. 6° 18′ N., Long. 121° 58′ E.*), in a depth of about 8 fathoms ($14^{m}6$) and also in the channel between Bubuan and Saluping islands, but the bottom in both places is rocky and the tidal streams are irregular. Heavy tide-rips, which sometimes have the appearance of breakers, frequently occur in the southern entrances to these channels.

Tapiantana channel.—Tapiantana channel, between the Tapiantana group on the south and Basilan island on the north, is clear of dangers in the fairway. On the northern side of the channel, separated from the southern side of Basilan island by Bihintinusa channel, about three-quarters of a mile wide, is Bihintinusa island; this island is low and fringed by a coral reef; a bank with depths of less than 3 fathoms ($5^{m}5$) over it, extends 1¾ miles east-north-eastward and, with depths of less than 5 fathoms ($9^{m}1$), extends about 1½ miles eastward from the island. Between Bihintinusa and Saluping islands there is a bank, with depths of from 40 to 60 feet ($12^{m}2$ to $18^{m}3$) over it, in the fairway.

Charts 2576, 943, 1263.

Chart 928.

Tidal streams.—The tidal streams in Tapiantana and Bihintinusa channels are strong, and set eastward and westward. In the channels among the islands of the Tapiantana group the tidal streams are very irregular in direction; at times there is an eddy close inshore.

PILAS ISLANDS.—Pilas islands is the name given to the group of islands situated westward and north-westward of Basilan island. The islands and dangers lying within a distance of 5 miles of the western and south-western coasts of Basilan are described with that island on pages 229-230.

Chart 961.

Pilas channel. — Islands. — Dangers. — Light. — Pilas channel, between Pilas island, situated about 10 miles westward of Basilan, on the west, and Mataja and Balukbaluk islands, on the east, is about 3½ miles wide, deep, and clear of dangers. The channel eastward of Mataja island is about 2½ miles wide, deep, and clear of dangers. The tidal streams in these channels attain a rate of 6 knots at springs, and set northward and southward.

Mataja (Mataha) island, 60 feet (18^{m}3) high, and heavily wooded, lies 4¼ miles eastward of Panducan (Pandukan) point, the southern extremity of Pilas island. A spit, with a depth of 9 feet (2^{m}7) over it, near its outer end, extends 8½ cables northward from the island; the other sides are steep-to. There is a lagoon on the western side of the island.

A light is exhibited, at an elevation of 62 feet (18^{m}9), from a white framework structure, on the south-eastern extremity of Mataja island.

A shoal, with a charted depth of 34 feet (10^{m}4) over it, but which was reported, in 1945, to have less, lies 2½ miles south-south-eastward of Mataja island light-structure.

Balukbaluk island, about 3½ miles northward of Mataja island (*Lat. 6° 35′ N., Long. 121° 41′ E.*), has a prominent wooded hill, 526 feet (160^{m}3) high, near the northern end; the southern part of the island is low, with a lagoon surrounded by mangrove in the interior.

Pilas island is low and flat, except in the extreme north, where there are two hills close together, 567 and 490 feet (172^{m}8 and 149^{m}3) high. Several shoals, with depths of less than 6 fathoms (11^{m}0) over them, lie within three-quarters of a mile of the north-eastern side of the island, and extend about one mile from the northern side. Tamila rock, 4 feet (1^{m}2) high, lies about half a mile north-westward of the northern extremity of the island. Except on the northern side of the island the coast is mostly fringed with mangrove, and the interior is practically submerged at high water. There are two lagoons in the island entered from the eastern side, but the channels nearly dry. The island is heavily wooded, the mangrove at the points projecting beyond the low water line.

Chart 928.

A bank as defined by the 10-fathom (18^{m}3) line extends about 10 miles south-south-eastward from Panducan point; on it there are several patches with depths of 25 and 28 feet (7^{m}6 and 8^{m}5) over them, the positions of which may be best seen on the chart. A shoal, with a least depth of 28 feet (8^{m}5) over it, lies about 8¼ miles south-eastward of the same point.

Chart 961.

Two shoals, with depths of 12 and 13 feet (3^{m}7 and 4^{m}0) over them,

Chart 961.

lie about 5 miles west-south-westward and 3¼ miles south-westward, respectively, of Panducan point.

Tagutu island, 185 feet (56^{m}4) high, lies about three-quarters of a mile south-eastward of the north-eastern extremity of Pilas island. A spit, with depths of less than 5 fathoms (9^{m}1) over it, extends about 6 cables southward from the island; the other sides of the island are steep-to. The channel between Tagutu and Pilas is deep and clear of danger in the fairway.

Islands and dangers westward and northward of Pilas island.—Anchorages.—Manangal island, 398 feet (121^{m}3) high, lies about a quarter of a mile westward of Pilas island; this summit, which lies at the south-western extremity of the island, is an excellent landmark from the north or south, but is not easily identified from the westward on account of the high land eastward.

The best anchorage in the Pilas islands may be obtained in the channel between Pilas and Manangal islands, in depths of from 5 to 6 fathoms (9^{m}1 to 11^{m}0), protected from the wind and sea except for a narrow sector from due south. It may be approached from either end. Anchorage may also be obtained half a mile northward of Manangal, in a depth of 11 fathoms (20^{m}1). A vessel approaching these anchorages from the northward should pass close eastward of Tamila rock, with the western extremity of Tabilunay island, situated 2 cables north-westward of Manangal island, in line with the south-eastern extremity of Siringo island, bearing 203°, which gives the north-western side of Pilas island a berth of at least a quarter of a mile, and if proceeding to the southern anchorage, which is more sheltered, the vessel should keep in mid-channel. The tidal streams here are weak. There are several other anchorages which may be obtained in fine weather in other parts of the group.

Charts 961, 928.

Lying within 5 miles of the western side of Pilas island, besides Manangal, is a group of heavily wooded islands, the names of which from south to north, are Pasigpasilan, Mamannak, Orell, Lemondo, Palajangan (Palahangan), Minis, Siringo, Saloro, and Cujangan (Kuhangan), the positions of most of which may best be seen on the chart. Close off the western side of Pilas island are Tiguilaban, and Tinutungan islets. The Bantolinos are a group of bare rocky islets, from 40 to 137 feet (12^{m}2 to 41^{m}8) high, lying close northward of Cujangan island (*Lat. 6° 39′ N., Long. 121° 32′ E.*).

A spit, with a depth of 18 feet (5^{m}5) over it, extends about 4 cables south-westward from Pasigpasilan island. A shoal, with a least depth of 7 feet (2^{m}1) over it, lies about one mile southward of Minis island, situated 3¼ miles north-westward of Pasigpasilan island, and a shoal, with a least depth of 22 feet (6^{m}7) over it, lies about 1½ miles westward of the southern extremity of the same island.

Chart 928.

Mindoro shoal, with a depth of 18 feet (5^{m}5) over it, lies about 4¼ miles south-westward of Minis island. A shoal, with a depth of 40 feet (12^{m}2) over it, lies 3¼ miles westward of Mindoro shoal. Two shoals, each with a depth of 33 feet (10^{m}1) over it, lie 2½ miles southward of Mindoro shoal, and about midway between Minis and Cujangan islands, respectively. A shoal, with a least depth of 25 feet (7^{m}6) over it, lies about 2 miles northward of Cujangan island. Puju reef, which dries,

Charts 2576, 943, 1263.

Chart 928.

lies close northward of Saloro island, situated about half a mile north-westward of Manangal island; a bank, with depths of from 7 to 18 feet (2^{m}1 to 5^{m}5) over it, extends thence northward to within a quarter of a mile westward of Tamila rock.

An extensive bank, with depths of less than 10 fathoms (18^{m}3) over it, extends from a position about 24 miles westward of the northern extremity of Pilas island, in an east-south-easterly direction for about 18 miles, and thence north-north-eastward for about 22 miles. On this bank there are several islands, which are described below, and numerous shoals, the positions of which may best be seen on the chart.

Dassalan island, 8 miles north-westward of Pilas island, has several sandy beaches, and there is a lagoon on the western side which can be entered by small boats at high water. A coral reef extends about a quarter of a mile from the northern side of the island, and about 4 cables from the south-western side. The southern part of the island is being cleared for coconut plantations.

Kaludlud island, about one mile west-north-westward of Dassalan island, is low, flat, and densely wooded. A reef extends about a quarter of a mile from the western side, where there is also some mangrove; the coast elsewhere is bordered by sand and coral.

A bank, with depths of less than 3 fathoms (5^{m}5) over it, extends about 2¾ miles westward from the northern end of Kaludlud island, and near the outer end of it are the Griffin rocks, with a depth of 10 feet (3^{m}0) over them.

Salkulakit and Lakit islets, 58 and 78 feet (17^{m}7 and 23^{m}8) high, respectively, lie 5¾ miles south-westward of Dassalan island.

Brutus reef, with a least depth of 7 feet (2^{m}1) over it, lies 4 miles north-north-westward of the Lakit islets.

Favorite bank, the northern extremity of which lies about 12½ miles westward of Brutus reef, has been described on page 195.

Sangboy islands are two remarkable islands lying about 6 miles north-eastward of Dassalan island; they may often be clearly seen when the high land of Basilan island is obscured by clouds. Both of the Sangboy islands are low in the southern part, but each have a wooded hill in the northern part, 843 and 626 feet (256^{m}9 and 190^{m}8) high, respectively, the south-western island being the higher. The coasts are sandy with the exception of the northern parts, which are covered with rocks. There are small Moro settlements on the islands and there are several coconut groves.

Swirl reef, with a depth of 13 feet (4^{m}0) over it, lies half a mile west-south-westward of the western extremity of the south-western of the Sangboy islands.

Chart 961.

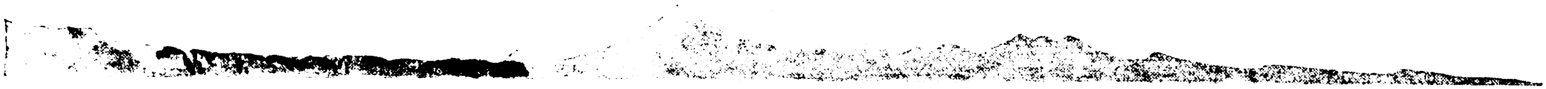
Teinga island (*Lat. 6° 54′ N., Long. 121° 35′ E.*), 15 feet (4^{m}6) high, and densely wooded, lies 3¼ miles north-north-eastward of Sangboy islands; it is fringed by a reef which extends on the western side, at the northern end, to the edge of the bank on which the island lies. About 2½ miles north-eastward of the island there is a 34-foot (10^{m}4) patch.

Chart 928.

Outlying dangers south-westward of Pilas island.—Halcon rock, which dries 5 feet (1^{m}5), lies about 17 miles south-westward of Panducan point. The rock is steep-to, and breaks except in a smooth sea.

Charts 2576, 943, 1263.

To face page 229.



Basilan island and part of Mindanao, from north-north-westward.

(*Original dated* 1844.)

Chart 928.

Pabunuan shoal, consisting of coral sand and shells, with a least depth of 2 fathoms ($3^{m}7$) over it, lies with its shoalest part 6¼ miles south-westward of Halcon rock. There are tide-rips and strong, irregular tidal streams in the vicinity of these dangers. About 5½ miles northward of Halcon rock, and also about 6½ miles northward of the 2-fathom ($3^{m}7$) patch on Pabunuan shoal, there is a 39-foot ($11^{m}9$) patch. The water is very clear and the bottom can usually be seen at a depth of 10 fathoms ($18^{m}3$).

BASILAN ISLAND.—Basilan island, separated from Mindanao by Basilan strait, is, for the greater part, mountainous and densely wooded. Basilan peak, the summit of the island, is 3,317 feet ($1{,}011^{m}0$) high, and lies near the centre. The coasts are largely fringed by a low belt of sand and coral débris, on which mangrove swamps have formed. There are no large rivers, and many of the small rivers can only be entered by boats at high water; most of them are impassable on account of fallen trees a short distance inside their mouths. *See* view facing this page.

Chart 961.

There are several prominent densely wooded peaks at the eastern end of the island. Mount Matanal, 2,066 feet ($629^{m}7$) high, lies about 1½ miles westward of Matanal point, the eastern extremity; Mount Sining Capan (Kapan), 1,828 feet ($557^{m}2$) high and Mount Cobung (Kobung), 2,000 feet ($609^{m}6$) high, and cone shaped, lie 7¼ miles westward and 9¼ miles west-south-westward, respectively, of Matanal point.

Chart 928.

South-western side of Basilan island.—Islets.—Dangers.—The south-western coast of Basilan island is fringed by a mangrove swamp through which several rivers flow into the sea; some of these can be entered by small boats.

Mangal point, the southern extremity of Basilan island, is a densely wooded strip of sand, about 10 feet ($3^{m}0$) high, lying along the outer edge of the mangrove swamp; there are similar stretches of sand eastward of the point.

About 2½ miles north-westward of Mangal point (*Lat. 6° 25′ N., Long. 121° 57′ E.*), and half a mile offshore is Lahatlahat islet, from the south-eastern side of which a coral reef, with a least depth of 13 feet ($4^{m}0$) over it, extends about 1½ miles parallel with the coast. About one mile north-westward of Lahatlahat islet is Canas island, separated from the coast of Basilan by a narrow, deep channel. These islands are covered with mangrove. Canas shoal, with a depth of 15 feet ($4^{m}6$) over it, lies half a mile westward of Canas island.

Cancuman (Kankuman) island, on which there is a prominent tree amongst the coconut trees, lies 3 miles westward of Canas island. A 39-foot ($11^{m}9$) patch lies one mile south-westward of Cancuman island.

Tamuk island, 245 feet ($74^{m}7$) high to the tops of the trees, lies 1¼ miles westward of Cancuman island. Two shoals, each with a depth of 40 feet ($12^{m}2$) over it, lie 2¾ miles west-south-westward and westward, respectively, of Tamuk island, and a 28 foot ($8^{m}5$) patch lies about 1½ miles north-north-westward of the island.

Charts 2576, 943, 1263.

Chart 927, plan of Port Holland.

Port Holland.—Light.—Port Holland, situated at the south-eastern end of Malusu bay, and 10 miles north-westward of Mangal point, affords well sheltered anchorage for small vessels. A wharf, 513 feet (156^{m}4) long, with depths of from 17 to 29 feet (5^{m}2 to 8^{m}8) alongside, is situated on the southern side of the port. A wharf, 55 feet (16^{m}8) long, with a depth of 6 feet (1^{m}8) alongside, lies about three-quarters of a cable eastward of the main wharf. Water may be obtained alongside the main wharf.

A light is exhibited at the western end of the wharf.

Great Gounan island, 330 feet (100^{m}6) high, and wooded, lies about one cable north-westward of the wharf, with a least depth of 6½ fathoms (11^{m}9) in the fairway between. Little Gounan island lies a quarter of a mile north-westward of Great Gounan island. A shoal (chart 961), with a depth of 28 feet (8^{m}5) over it, lies about 3½ cables northward of Little Gounan island. These islands have been partly cleared and Great Gounan is cultivated.

The best approach to the wharf is southward of Great Gounan island. The shoal water extending off the mouth of the Malusu river (chart 961) and the absence of good leading marks makes it dangerous to pass northward and eastward of Great Gounan.

The tidal streams turn about half an hour after high and low water, and run at a rate of from 2 to 3 knots, stronger on the west-going stream.

A few provisions may be obtained.

There is regular steamer communication with Cebu and Manila.

Chart 961.

Western side of Basilan island. — Islets. — Dangers. — About 3½ cables southward of the light-structure at Port Holland is the entrance to a bight, in the middle of which is Kapisahin islet (*Lat. 6° 32′ N., Long. 121° 52′ E.*), covered with mangroves.

Malusu bay, about 3¼ miles wide at its entrance between Port Holland and a point north-westward, affords anchorage out of the strong tidal stream. The shores consist of a narrow ridge of sand and broken coral, behind which are the usual mangrove swamps. Shoal water, with coral heads, awash, extend about 6 cables from the head of the small bight into which the Malusu river flows, at the south-eastern end of the bay, and a bank, with depths of from 28 to 36 feet (8^{m}5 to 11^{m}0) front the middle part of the bay, about three-quarters of a mile offshore. Canabungan (Kanabungan) river, which flows into the northern part of Malusu bay, is wide, but can be entered only by small boats.

Pangasahan hill, 929 feet (283^{m}2) high to the tops of the trees, lies about 1½ miles northward of the north-western entrance point of Malusu bay, and is conspicuous from all directions. From it the land slopes gradually to the coast.

Pangasahan island is separated from the western extremity of Basilan island by Pangasahan channel, a narrow, tortuous passage, with a least depth of 25 feet (7^{m}6) at the northern end. The channel is fringed with mangroves and Pangasahan river flows into its northern end ; this channel affords good shelter to small craft, and there is a good landing place close westward of the mouth of the river.

Between the northern end of Pangasahan channel and Basilan point, about 4½ miles north-north-eastward, the coast is heavily

Chart 961.

wooded and fringed by a narrow strip of coral and sand, backed by mangrove swamp in places. A 3-fathom ($5^{m}5$) patch lies about one mile north-north-westward of the northern extremity of Pangasahan island and 6½ cables offshore. There are several other shoals, with depths of less than 6 fathoms ($11^{m}0$), lying from three-quarters of a mile to one mile off this stretch of coast. Bagbagan river, which flows out about one mile south-westward of Basilan point, may be entered by small boats.

Takela and Goreno islands, about 2 miles south-westward and 1¾ miles westward, respectively, of the light-structure at Port Holland, are covered with mangroves. A 27-foot ($8^{m}2$) patch lies close off the northern extremity of Takela island, and a 28-foot ($8^{m}5$) patch lies 4½ cables northward of Goreno island.

Pandak island, 80 feet ($24^{m}4$) high, lies about 2½ miles westward of Takela island. Dalauan island, 67 feet ($20^{m}4$) high, and Langas island, 97 feet ($29^{m}6$) high, lie about half a mile south-westward and 1½ miles west-north-westward, respectively, of Pandak island. Tengolan island, 108 feet ($32^{m}9$) high, lies about one mile northward of Pandak island. These four islands are lightly wooded. A 28-foot ($8^{m}5$) patch lies about 3 cables southward of the south-eastern extremity of Tengolan island. A 4-foot ($1^{m}2$) patch and a 9-foot ($2^{m}7$) patch lie about a quarter of a mile southward and the same distance northward, respectively, of Langas island. A shoal, with a depth of 34 feet ($10^{m}4$) over it, lies about 2¼ miles westward of the southern extremity of Langas island, but, in 1945, less water was reported over it.

Sicagot (Sikagot) island, 94 feet ($28^{m}7$) high and heavily wooded, lies about 1½ miles north-north-westward of Langas island. Kaluitan island, 123 feet ($37^{m}5$) high, and Sibakel island, 120 feet ($36^{m}6$) high, both heavily wooded, lie about 1½ and 3¼ miles, respectively, north-westward of Tengolan island. A shoal, with a depth of 18 feet ($5^{m}5$) over it, lies about 4 cables south-eastward of Sicagot ; a bank, with depths of from 13 to 27 feet ($4^{m}0$ to $8^{m}2$) over it, extends one mile south-eastward from Kaluitan ; and a bank, with depths of less than 6 fathoms ($11^{m}0$) over it, extends about three-quarters of a mile northward from Sibakel.

All the above-mentioned islands are low and uninhabited. The shoals are generally marked by swirls and tide-rips, and there are frequently tide-rips off the points of the islands. The tidal streams are irregular, and often attain a rate of over 3 knots, setting northward and southward along the coast.

Malamaui road and approaches. — Dangers. — Beacons. — Malamaui road, south-westward of Malamaui island, situated 6 miles east-north-eastward of Basilan point (*Lat. 6° 41′ N., Long. 121° 51′ E.*), affords a safe anchorage for vessels of all sizes ; the holding ground is good and strong winds seldom blow. The shores are generally low and bordered by coral reefs. Malamaui island is 370 feet ($112^{m}8$) high, and cultivated. Panigayan is a small settlement at the south-western end of the island.

Abreast the streams there is usually sufficient depth over the reef at high water to permit the entrance of a ship's boat, and it is advisable to land at these points, as there is frequently enough surf to damage a boat attempting to land along the coast at other places.

Two shoals, with a depth of 22 feet ($6^{m}7$) over them, lie about

Charts 928, 2576, 943, 1263.

Chart 961.

1½ miles northward and 2½ miles north-north-eastward, respectively, of Basilan point, and a 6-fathom ($11^{m}0$) patch lies about 3 miles northward of the same point. There are several other shoal patches northward and north-westward of Basilan point, the positions of which may best be seen on the chart.

Lampinigan island, 188 feet ($57^{m}3$) high, lies about 1¾ miles east-north-eastward of Basilan point and about one mile offshore; it is covered with coconut trees which grow to the water's edge in places. There is a boat landing place, with a depth of 9 feet ($2^{m}7$) alongside, at Lampinigan village in the bight on the southern side of the island.

Pamelukan bank, over which there is a least depth of about 4 feet ($1^{m}2$), lies 2 miles north-eastward of Lampinigan island. There are several banks, with depths of from 39 to 54 feet ($11^{m}9$ to $16^{m}5$) over them, lying within about 3½ miles of the north-western side of Malamaui island, the positions of which may best be seen on the chart. A 34-foot ($10^{m}4$) patch lies about 6 cables off the middle of the north-western side of the island.

Balatanai islet lies close off the north-western coast of Basilan island, and 2 miles east-south-eastward of Lampinigan island. Moro island, lying about 1¾ cables off the southern extremity of Malamaui island, is low, covered with trees and scrub, and is generally visible at a distance of 7 miles.

A coral shoal, with a depth of 13 feet ($4^{m}0$) over it, lies about 1¼ miles south-westward of Moro island, and on the southern side of the fairway. A 16-foot ($4^{m}9$) patch lies about 1¼ cables westward of the same island, and a reef, which dries, lies about the same distance south-eastward; this reef is nearly always covered with driftwood, and well marked by tide-rips round the edges.

A coral reef extends from about half a cable to 1½ cables from the south-western side of Malamaui island. At the outer end of this reef, and half a mile westward of Moro island is a depth of one foot ($0^{m}3$).

Two unofficial leading beacons stand on the southern side of Malamaui island, and there are several unofficial beacons situated off the south-western side.

Anchorage.—Directions.—The best anchorage is off San Rafael bay, situated on the southern side of the road eastward of Balatanai islet. Small craft may anchor close in eastward of Balatanai islet. In approaching this anchorage from the northward Pamelukan bank is the only danger to be avoided. Unless there is sufficient light to make out the islet and the high land behind it, it is advisable to pass westward of Pamelukan bank and steer for Lampinigan island, which usually can be easily distinguished. The general character of the land makes it difficult to estimate the distances at night. Lampinigan island (*Lat. 6° 41′ N., Long. 121° 53′ E.*) may be safely approached, and from its vicinity Balatanai islet can usually be identified, or a good anchorage may be obtained southward of Lampinigan island.

If proceeding to the anchorage off Isabela vessels may pass northward or southward of Moro island, but the channel on the northern side is the wider and has a greater depth.

Isabela channel.—Light.—Isabela channel, separating Malamaui island from the north-western side of Basilan island, has a least width

Charts 928, 2576a, 943, 1263.

Chart 961.

of about 1½ cables. The shores are fringed with mangrove except for sand spits at each end and small openings at Isabela and at the former constabulary landing on the opposite shore. The sides of the channel are coral, almost vertical, with the mangrove growing nearly to the edge, and in most places a vessel can go within a boat's length of it. Kalut island lies in a bight on the eastern side of Malamaui island, near the north-eastern end of the channel.

The principal dangers in the channel are the reef, which dries, lying south-eastward of Moro island, mentioned above; a shoal, with a depth of 4 feet ($1^{m}2$) over it, on the south-eastern side of the fairway, situated about half a mile north-eastward of Isabela wharves, and a shoal, with a depth of about one foot ($0^{m}3$), on the south-eastern side at the north-eastern entrance. The fairway, with a depth of 5 fathoms ($9^{m}1$), is very narrow and tortuous and is only available for vessels with local knowledge. In the approach to the north-eastern end there is a 28-foot ($8^{m}5$) patch lying 4½ cables off the north-eastern end of Malamaui island.

A light is exhibited, at an elevation of 36 feet ($11^{m}0$), from a white concrete tower, near the eastern extremity of Malamaui island.

Anchorages. — Directions. — The best anchorage in Isabela channel for vessels with local knowledge is north-westward of the head of the westernmost wharf at Isabela, in depths of from 6 to 9 fathoms ($11^{m}0$ to $16^{m}5$), coral and sand. There is also good anchorage in the channel northward of Kalut island, but there is not much swinging room; the larger vessels secure by hawsers to the mangroves on shore.

Isabela channel can be entered from either end, but it is preferable to enter against the tidal stream to avoid turning in the channel. Vessels entering the south-western end should follow the directions given above for Malamaui road. If passing northward of Moro island, the north-eastern point of the island should not be approached too closely as the tidal stream appears to set towards the reef which extends a short distance from that point. The channel southward of the island is good, but the tidal streams set across it, so that care is necessary not to be set on to the reef which dries south-eastward of the island.

If entering by the north-eastern end a vessel should steer to pass about 1¼ cables from the lighthouse on Malamaui island to avoid the shoal, with a depth of one foot ($0^{m}3$) over it, on the south-eastern side of the fairway, thence she should steer to pass eastward of a shoal, with a depth of 15 feet ($4^{m}6$) over it, lying three-quarters of a cable eastward of Kalut island (*Lat. 6° 44′ N., Long. 121° 59′ E.*), thence keep towards the north-western shore to avoid the 4-foot ($1^{m}2$) shoal, situated half a mile north-eastward of Isabela wharves, and thence in mid-channel to the anchorage off Isabela.

Tidal streams.—In Isabela channel the north-east-going stream sets at a rate of from 4 to 5 knots; it flows for a considerably longer period than the south-west-going stream, which has a rate of about one knot less. Heavy tide-rips may be encountered at the entrances when the wind is against the stream.

Close westward of Malamaui island, a northerly or southerly set will usually be experienced, the rate diminishing as the distance from the island increases.

Charts 928, 2576, 943, 1263.

Chart 961.

Isabela.—Isabela, at the south-western end of Isabela channel, and on the south-eastern side, was formerly the headquarters of a constabulary post; there are several rubber and coconut plantations in the vicinity.

There are three wharves, the westernmost and largest of which is 500 feet (152^{m}4) long, with a depth of 33 feet (10^{m}1) at its western end, and 40 feet (12^{m}2) at its eastern end. The middle wharf is 210 feet (64^{m}0) long, with a depth of 20 feet (6^{m}1) alongside. The eastern wharf is 400 feet (121^{m}9) long, with a depth of 30 feet (9^{m}1) alongside. There is a crane with a lifting capacity of 10 tons on this wharf, and water is laid on to it.

There are two small landing piers on Malamaui island, opposite Isabela, with depths, in 1937, of 9 and 11 feet (2^{m}7 and 3^{m}4), respectively.

Northern side of Basilan island.—Dangers.—The northern coast of Basilan island is bordered by a succession of mangroves and of sand and broken coral beaches.

A 39-foot (11^{m}9) patch lies about three-quarters of a mile offshore 2¼ miles east-north-eastward of the eastern extremity of Malamaui island. In the bay between Batupare point, situated about 4¾ miles eastward of Malamaui island, and Calagusang (Kalagusang) point, 3 miles south-eastward of Batupare point, there is a rock, awash, and several shoals, with depths of from 16 to 30 feet (4^{m}9 to 9^{m}1) over them.

Lamitan, situated about 1¼ miles up the Gubauan river, which flows into Look Sambang bay, about 3½ miles south-eastward of Calagusang point, is the principal town on this coast.

There is a pier, with a depth of 21 feet (6^{m}4) alongside, on Kulibato point, the south-eastern entrance point of Look Sambang bay.

Luzon reef, with a least depth of 21 feet (6^{m}4) over it, and steep-to, lies about 2 miles northward of Batupare point. About 2 miles north-eastward of this point is a shoal, with a least depth of 34 feet (10^{m}4), from which depths of from 37 to 48 feet (11^{m}3 to 14^{m}6) extend about 3 miles south-eastward.

Chart 928.

Southern and south-eastern sides of Basilan island.—The southern coast of Basilan island is bordered by a mangrove swamp, through which several rivers discharge; some of these can be entered by small boats.

Mangal river flows out about one mile eastward of Mangal point, and has depths of one and 2 fathoms (1^{m}8 and 3^{m}7) inside the bar. It is navigable for boats with a maximum draught of 3 feet (0^{m}9) for a distance of one mile. The best channel over the bar is near the western side. Mangrove extends about 3½ cables from the entrance, beyond which there is a steep, wooded cliff from 100 to 200 feet (30^{m}5 to 61^{m}0) high.

Bihintinusa island (*Lat. 6° 24′ N., Long. 122° 03′ E.*), situated about 4½ miles eastward of Mangal point, has been described on page 225.

Chart 927, plan of Amoyloi anchorage.

Amoyloi anchorage. — Dangers. — Amoyloi anchorage is off Amoyloi village, situated about 10 miles east-north-eastward of Mangal point.

Amoyloi reefs consist of two reefs which dry, separated by a narrow

Charts 2576, 943, 1263.

Chart 927, plan of Amoyloi anchorage.

channel, lying from about half to one mile offshore. On the northern side of the western reef are some shifting sand cays, and at the north-western extremity of the eastern reef there is an islet, 3 feet ($0^{m}9$) high. About midway between the northern side of the eastern reef and the coast there is a shoal, with a least depth of 1¼ fathoms ($2^{m}3$), and about 2 cables north-westward of it is a 2¾-fathom ($5^{m}0$) patch. Near the middle of the fairway of the eastern entrance is a shoal, with a depth of 5½ fathoms ($10^{m}1$) over it.

The anchorage may be entered from westward between the bank extending about half a mile westward from the western of the Amoyloi reefs, and a shoal, with a least depth of 1½ fathoms ($2^{m}7$) over it, lying about 3 cables off the coast of Basilan and about 1¼ miles west-south-westward of Amoyloi village. The channel is about one cable wide between the 6-fathom ($11^{m}0$) lines on either side. There is also a channel about three-quarters of a cable wide, with a least charted depth of 6¼ fathoms ($11^{m}4$), leading to the anchorage between the detached shoal and the coast.

Anchorage may be obtained, in depths of from 15 to 20 fathoms ($27^{m}4$ to $36^{m}6$), fine sand, southward of Amoyloi village.

Chart 927, plan of Bojelebung and Kauluan channels.

Islands and dangers. — Channels. — Kauluan island (*Lat. 6° 28′ N., Long. 122° 13′ E.*), about 4 miles eastward of Amoyloi village, is mostly a mangrove swamp surrounded by a coral reef which dries.

Kauluan channel, entered about three-quarters of a mile south-westward of the western extremity of Kauluan island, extends northward for about 4 miles between the western side of Kauluan island and the reefs, which dry in places, northward of it, on the east, and the coast of Basilan island, on the west. The channel is only half a cable wide in places, and tortuous. There is a least depth of 3¼ fathoms ($5^{m}9$) in the fairway of the entrance.

About 1¼ miles north-north-eastward of the northern extremity of Kauluan island is Takippamasilaan island, consisting of a narrow ridge of sand and coral rocks, lying at the south-eastern end of the reef of the same name. The greater part of the reef is always covered, but at the northern end it dries and has on it two sand cays, 3 feet ($0^{m}9$) high.

Bojelebung channel, a deep passage about 2 cables wide, is entered about one mile north-north-westward of Takippamasilaan island, and leads between reefs, which dry, on either side to the anchorage off Bojelebung, the principal town on the east coast of Basilan island. On the southern end of the reef on the northern side of the channel there is a sand cay, and close within the northern edge of the reef on the southern side of the channel are two rocks, 3 feet ($0^{m}9$) high.

Anchorages.—Directions.—Anchorage may be obtained off the town of Bojelebung, in depths of from 16 to 17 fathoms ($29^{m}3$ to $31^{m}1$), coral, about 2¾ cables offshore. On approaching Bojelebung channel vessels should steer for the grassy hill, 680 feet ($207^{m}3$) high, situated about 6 cables south-westward of the town, bearing 268°, which leads through in mid-channel.

Anchorage may be obtained in the channel westward of Takippamasilaan reef, about 6½ cables southward of the western sand cay on the northern end of that reef, in depths of from 12 to 15 fathoms ($21^{m}9$ to $27^{m}4$), sand. The best approach is from the north.

Charts 928, 2576, 943, 1263.

Chart 961.

Takut Tangug bay.—Dangers.—Takut Tangug bay is entered between Kauluan island (chart 928) and the southern side of Matanal point (*Lat. 6° 37′ N., Long. 122° 20′ E.*), about 9 miles north-eastward. An extensive shoal, with depths of from one foot to 6 fathoms ($0^{m}3$ to $11^{m}0$) over it, extends north-eastward across the bay from a position about 3½ miles northward of Kauluan island, leaving a narrow deep channel at the north-eastern end into the inner part of the bay where vessels may obtain anchorage, in depths of from 10 to 20 fathoms ($18^{m}3$ to $36^{m}6$), coral and sand. Small craft may find better protected anchorage in the mouth of Kandiis river, at the north-eastern end of the bay, in a depth of about 2 fathoms ($3^{m}7$), mud. Small boats can ascend the river about one mile, where there is a depth of about 6 feet ($1^{m}8$).

Charts 3811, 928, 2576, 943, 1263.

CHAPTER VII

BASILAN STRAIT—WEST AND SOUTH COASTS OF MINDANAO

Chart 961.

BASILAN STRAIT.—Basilan strait, separating the southwestern end of Mindanao from Basilan island, has a least width of 8½ miles. The Santa Cruz islands and bank, situated on the Mindanao side, divide the strait into two channels, each of which is navigable. The northern channel, although the narrower, is generally preferred by sailing vessels, as it offers the advantage of an anchorage off the coast of Mindanao in case of a calm, thus avoiding being carried away by the tidal stream.

Climate and weather.—*See* page 16.

Tidal streams.—Tides.—In Basilan strait the tidal streams follow the direction of the channel, and near the islands and shoals they follow the edge of the reefs, and set westward and eastward, at a rate of from 2 to 3 knots at neaps, and from 5 to 6 knots at springs. The streams have been observed, however, to set in the reverse way in the months of November and December, and sometimes to set in the same direction for 24 hours, generally east-going, although there have been two high tides and two low tides on the same day. With these exceptional cases the turn of the tidal stream at Zamboanga takes place with slight differences at the hours of high and low water.

The turn of the streams takes place later in the strait than at Zamboanga. The change begins first on the coast of Mindanao, then in the strait, and finally on the coast of Basilan.

About three-quarters of a mile off San Ramon (page 241) the tidal streams set northward and southward at the rate of one knot, and off Dumagasa point, about 5 miles northward, they set in the same direction at a rate of three-quarters of a knot. Tide-rips occur off the coast between San Ramon and Caldera point (*Lat. 6° 57′ N., Long. 121° 58′ E.*).

At Zamboanga (page 239) there are generally two tides in the lunar day, but when the moon is in greatest declination at about neaps, single day tides occur. These astronomical conditions occur about the equinoxes. The same phenomenon is observed here as in the China sea, viz., the highest tide follows the moon's superior transit when she has southern declination, and the inferior transit when she has northern declination.

Southern side of Basilan strait.—The southern side of Basilan strait, formed by the northern side of Basilan island, is described on page 234.

Charts 3811, 928, 2576, 943, 1263.

Chart 961.

Islands and dangers.—Lights.—Buoys.—Santa Cruz bank is a coral bank, the northern edge of which lies about 1½ miles from the coast of Mindanao. Great Santa Cruz island, low, flat, wooded, and fringed by a narrow reef, lies on the eastern part of the bank. Little Santa Cruz island, low, flat, and wooded, lies 7 cables north-westward of Great Santa Cruz, and on the northern edge of the bank. A reef, which dries, extends half a mile from the eastern and western extremities of Little Santa Cruz, and a bank, with depths of from 4 to 12 feet ($1^{m}2$ to $3^{m}7$) over it, extends about 1¼ miles north-westward from the extremity of the drying reef at the western end.

A black conical buoy marks the north-western extremity of this bank.

A light (*Lat. 6° 53′ N., Long. 122° 03′ E.*) is exhibited, at an elevation of 53 feet ($16^{m}2$), from a white framework structure, on Little Santa Cruz island.

On the shoalest detached part of Santa Cruz bank there is a depth of 3 feet ($0^{m}9$), situated near the southern edge about 2 miles westward of Great Santa Cruz island; it is marked by a yellow conical buoy, moored close south-eastward of it.

The north-western end of Santa Cruz bank is marked by three conical buoys, one painted red, one painted yellow and the third painted white. The positions of these buoys may best be seen on the chart.

President shoal, with depths of from 15 to 28 feet ($4^{m}6$ to $8^{m}5$) over it, lies on the southern edge of Santa Cruz bank, southward and south-eastward of Great Santa Cruz island.

Two black can buoys are moored at the eastern end of President shoal; one about one mile south-eastward and the other about 1¼ miles east-south-eastward of the eastern extremity of Santa Cruz island.

There are several other shoal patches with depths of from 13 to 28 feet ($4^{m}0$ to $8^{m}5$) over them, lying near the edge of the bank, the positions of which may best be seen on the chart.

A black can buoy is moored close northward of a 15-foot ($4^{m}6$) patch, situated about 8 cables north-eastward of the eastern extremity of Great Santa Cruz island.

A shoal, with a least depth of 39 feet ($11^{m}9$) over it, lies on the southern side of the fairway of Basilan strait, about 3½ miles north-westward of the northern extremity of Malamaui island.

Tictauan (Tiktauan) island, on the northern side of the strait, lies 1¾ miles eastward of Mariqui point (page 241). It is low and entirely covered with mangrove, with the exception of a narrow strip of sand beach at the western end, and a larger strip at the eastern end, where there are a few coconut trees and a small village. At the latter end of the island there is a reef, which dries, and extends 2¾ cables offshore. Banks, with depths of from 7 to 30 feet ($2^{m}1$ to $9^{m}1$) over them, extend about 1¾ miles north-eastward from Tictauan island; a bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends 6½ cables from the southern side, and half a mile south-westward from the western extremity.

Malanipa island, 350 feet ($106^{m}7$) high, and wooded, lies about 6½ miles eastward of Tictauan island. Little Malanipa island (*Lat. 6° 53′ N., Long. 122° 18′ E.*), which is also wooded, lies on a bank extending about half a mile eastward from the southern extremity of Malanipa island. From the western side of Malanipa island a bank of

Charts 3811, 928, 2576, 943, 1263.

Chart 961.

fine sand, named Great Sand bank, with a least depth of 3 feet ($0^{m}9$) over it, situated about three-quarters of a mile offshore, extends 5 miles westward.

Coco (Koko) island, 460 feet ($140^{m}2$) high, and densely wooded, lies on the southern side of the fairway, 8¼ miles southward of Malanipa island ; it is fringed by a reef which is steep-to at a distance of 2 cables. Little Coco (Koko) island, covered with vegetation, lies about a quarter of a mile north-westward of Coco island, with a navigable channel between, but there is a spit, with a depth of 9 feet ($2^{m}7$) over it, extending about 2 cables from the north-western side of Coco island.

Lanhil island (*Lat. 6° 46′ N., Long. 122° 22′ E.*), 560 feet ($170^{m}7$) high and densely wooded, lies 6¼ miles east-north-eastward of Coco island. Its coast is low, and the reef which fringes the island dries and extends a quarter of a mile from the eastern side.

Sibago island, 630 feet ($192^{m}0$) high, and covered with vegetation, lies 1½ miles south-eastward of Lanhil island, with a deep channel clear of dangers between. The coast is low, and extending 6 cables from its south-eastern side is a bank, with depths of from 13 to 45 feet ($4^{m}0$ to $13^{m}7$) over it.

A light is exhibited, at an elevation of 692 feet ($210^{m}9$), from a black steel circular tower, on the summit of Sibago island.

Northern side of Basilan strait.—Caldera bay and port lie close eastward of Caldera point, a sandy point, situated about 11½ miles northward of Malamaui island. Anchorage may be obtained in the bay, in depths of from 6 to 8 fathoms ($11^{m}0$ to $14^{m}6$), sand. There is sufficient space in the inner port for four or five small craft of 6 feet ($1^{m}8$) draught ; the entrance channel is 70 yards ($64^{m}0$) wide, with a depth of 2 fathoms ($3^{m}7$). Two small wharves, with depths of 28 and 14 feet ($8^{m}5$ and $4^{m}3$), respectively, at their head, in the port can each accommodate one steamer. There are some oil tanks visible from eastward. The tidal streams set strongly on to Caldera point.

Between Caldera point and Zamboanga, about 7 miles east-south-eastward, the coast consists of sand beaches with some rocky bluffs, and is low, steep, and wooded. Vessels may obtain anchorage off the town of San Mateo, 4 miles east-south-eastward of Caldera point (*Lat. 6° 57′ N., Long. 121° 58′ E.*), over a bank of sand, in depths of from 8 to 15 fathoms ($14^{m}6$ to $27^{m}4$), but elsewhere along this coast the bottom is foul and uneven.

Zamboanga. — Buoy. — Zamboanga, the principal town in Mindanao, and the capital of the Province of Zamboanga, is situated at the southern extremity of Zamboanga peninsula. The estimated population, in 1937, was about 30,000, of whom about 70 were Americans or Europeans. It is a port of entry and open to foreign shipping.

There is a concrete wharf with a **T**-end about 800 feet ($243^{m}8$) long, with a depth alongside, in 1948, of 27 feet ($8^{m}2$) at its eastern end, decreasing gradually to 17 feet ($5^{m}2$) at its western end. The coastal bank westward of the wharf has extended seaward.

There is a current indicator on the wharf close to the light-structure. It consists of an arrow which points in the direction of the current, and is in a horizontal position when the current is at its strength, and vertical when it is slack. It is illuminated at night by *green* lights, and it is usually sighted before the *red* light on the pier is picked up. It should be used with caution, owing to the strong eddies. It

Charts 3811, 928, 2576, 943, 1263.

was reported, in 1949, that the current indicator does not respond to currents of less than 3 knots.

A breakwater lies about half a cable inside, and parallel with, the north-western end of the **T**-head of the wharf.

A red conical buoy marks the edge of the shoal about 2¼ cables south-eastward of the light-structure.

There are two prominent black iron chimneys situated close westward of the mouth of the Hondo river, about three-quarters of a mile eastward of the pier.

Anchorage.—The anchorage off Zamboanga is not good; the narrow bank that forms it is very steep, and in depths of over 12 fathoms ($21^{m}9$) the bottom is hard and uneven, and many vessels have lost their anchors here. The best anchorage is reported to be, in a depth of 16 fathoms ($29^{m}3$), southward of the red conical buoy south-eastward of the light-structure. This anchorage is much exposed to gales from westward and south-westward. A heavy sea sets in with these gales and is increased when the stream sets against the wind.

The approach of these storms is generally foretold by the coast of Basilan being hidden by masses of flying clouds, and the Sangboy islands being lost to view; and if at the same time it should be cloudy, dark, and threatening to the north-westward bad weather is certain.

During the North-east monsoon the road is sheltered and the water smooth.

In January, 1934, H.M.S. *Sandwich* obtained anchorage, in a depth of 15 fathoms ($27^{m}4$), with the pier-head bearing 002°, distant 2 cables. The tidal stream was running at a considerable rate, and it was considered advisable to stem it before anchoring.

Harbour limits.—Zamboanga harbour is defined as that portion of Basilan strait within the following boundaries:—

A line extending from the east bank of Hondo river south to its intersection with a line drawn east from the east point of Little Santa Cruz island; thence to the east point of Little Santa Cruz island (*Lat. 6° 53′ N., Long. 122° 03′ E.*) north to Mindanao island, thence along the coast of Mindanao island to the east bank of the mouth of Hondo river.

Harbour facilities.—Water may be obtained alongside the wharf. A limited supply of fresh provisions and ice may be obtained.

There are two hospitals for Europeans in the town.

A small quantity of fuel oil is maintained and can be taken in by a vessel alongside, or moored close off the pier.

Deratisation.—For deratisation, *see* page 4.

Storm signals.—Storm signals are displayed from a mast in front of the Custom house at the inner end of the pier.

Communication.—There is regular steamer communication with other ports in the Philippines. Steamers call regularly from Australia, Singapore and Hong Kong.

Zamboanga is connected to the general telegraph system.

Radio station.—There is a radio station situated about 2½ miles west-north-westward of the pier; the framework steel tower is prominent. *See* page 14.

Berthing facilities.—Large vessels lie alongside the outer face of the **T**-head. Care is necessary on approaching the wharf especially on the west-going tidal stream, as the shore bank, with depths of from 2 to

Chart 961.

3 fathoms (3^{m}7 to 5^{m}5) over it, westward of the wharf, extends beyond the line of the **T**-head. The wharf should be approached against the tidal stream.

Small vessels lie alongside the inner face of the **T**-head at the eastern end, where there is a depth of 21 feet (6^{m}4) at the outer end, decreasing to 15 feet (4^{m}6) at the inner end.

There is a concrete arm, with a depth of 10 feet (3^{m}0) alongside the southern side, extending south-eastward from the eastern side of the wharf.

Climatic table.—*See* page 32.

Coast.—Between Zamboanga and Mariqui (Mariki) point (*Lat. 6° 53′ N., Long. 122° 06′ E.*), about 2 miles east-south-eastward and thence to the mouth of Masinloc (Masinlok) river, about 3¾ miles north-eastward, the coast is low and composed of mangroves and is fringed by a narrow reef which dries. A bank, with depths of less than 5 fathoms (9^{m}1) over it, extends off the coast close eastward of Mariqui point, a depth of 28 feet (8^{m}5) being found half a mile offshore about 6½ cables eastward of the point.

For the description of the coast farther northward, *see* page 247.

Chart 943.

MINDANAO. — Mindanao, the second largest island of the Philippines, is indented by many deep bights, Iligan on the north and Illana on the south, nearly dividing the island in two, the isthmus between them being only 7½ miles wide at the narrowest part, at the head of Panguil bay. The island is mountainous and drained principally by two large rivers, the Agusan, which rises not far from Davao gulf and flows northward into Butuan bay on the north coast, and the Rio Grande de Mindanao, which drains an extensive plain with several large lakes and rivers and enters Illana bay through an extensive delta near Bongo island.

Mount Apo, 9,690 feet (2,953^{m}5) high, situated about 20 miles west-south-westward of Davao, on the southern side of the island, is probably the highest point on the island and in the whole of the Philippines. The island has a hot and humid climate, more equable than Luzon. It is under the influence of the monsoons of the northern hemisphere, but is largely outside the typhoon region. It has all the products of the other islands. About half the population is classed as non-Christian.

Mindanao is connected with the general telegraph system. Zamboanga, at the south-western extremity of the island, is the largest commercial port; Davao is a port of entry for the south-eastern part of the island; the small ports on the north and east coasts are in communication by steamer with Cebu and Iloilo.

Chart 961.

WESTERN SIDE OF MINDANAO.—Coast.—San Ramon, about 3¾ miles north-westward of Caldera point (page 239), is the site of a penal colony, the buildings of which are prominent both by day and night, as many lights are kept on all night.

Chart 3811.

The coast thence to Batalampon point, 7 miles north-north-westward, is low, covered with trees, and bordered with steep sand beaches. Batalampon point is backed by a small hill, 450 feet (137^{m}2) high, flat

Charts 928, 2576, 943, 1263.

Chart 3811.

on top, and densely wooded. Vessels approaching from northward by night should keep well clear of Alimpaya point, 2¼ miles northward of Batalampon point, as it is low and flat, and does not show up well against the higher point southward.

Between Batalampon point and Pangian point, 12¼ miles north-north-eastward, the coast is clear of dangers except for the Migalog rocks, which lie close offshore, in the northern approach to Lintangan village, situated about 5 miles south-westward of Pangian point.

Chart 957, plan of Sibuko bay.

Sibuco bay.—Sibuco (Sibuko) bay is entered between Pangian point (*Lat. 7° 17′ N., Long. 122° 01′ E.*) and Sibuco (Sibuko) point, 3¼ miles northward. The depths in the bay are considerable, but an anchorage may be obtained by vessels with local knowledge close inshore, at the south-eastern corner ; there is, however, no protection during either monsoon, and a considerable swell sets in. The town of Sibuco is situated at the head of the bay.

Chart 3811.

Coast.—Batotindoc (Bototindok) point, about 1¾ miles north-north-westward of Sibuco point, is high and steep, with a pinnacle rock, which can only be seen when close offshore northward or southward of it, close off it. A rock, 10 feet ($3^{m}0$) high, lies close offshore abreast the mouth of Mantibug river, which discharges about 4 miles northward of Batotindoc point. Temporary anchorage may be obtained at various places along the coast. The points are generally rocky and steep-to, with small streams flowing into the bights between them.

Kauit bay, entered between Banga point, situated 3 miles northward of Mantibug point, which lies about 1¾ miles northward of Mantibug river, and Talulu point, 1½ miles farther northward, is open to the westward and south-westward. The best anchorage for vessels with local knowledge is in the south-eastern corner of the bay, where it is fairly well protected from north-eastward.

Piacan bay, entered between a point situated half a mile eastward of the northern extremity of Cauit point, which lies about three-quarters of a mile northward of Talulu point, and Piacan point, about one mile north-eastward, affords good protection to vessels with local knowledge during south-westerly winds. In the middle of the entrance is Pina islet, 190 feet ($57^{m}9$) high. Vessels may pass on either side of the islet when approaching the anchorage, but a spit extends about one cable from the northern and eastern sides of the islet.

Panabutan bay.—Panabutan bay, entered between Siraguay point, situated about 1¼ miles north-north-eastward of Piacan point, and Panabutan point, about 2 miles farther north-north-eastward, affords sheltered anchorage for vessels with local knowledge during both monsoons. The best shelter is in the northern part of the bay, in a depth of 10 fathoms ($18^{m}3$), sand.

The ruins of a wharf are situated about 2 cables north-eastward of Panabutan point.

Panabutan and Siraguay rivers flow into the north-eastern and eastern sides, respectively, of the bay. Close southward of the mouth of Siraguay river a coral reef extends 3¼ cables offshore, with a rock, awash, half a cable outside the edge of the reef. This is the only danger in the bay.

Charts 2576, 943, 1263.

Chart 3811.

A good mark for approaching Panabutan bay is a hill, 680 feet (207^{m}3) high, about half a mile north-eastward of Balatacan (Balatakan) point, situated about 2 miles north-westward of Panabutan point; it is densely wooded except the lower slope of its southern side.

A rock, awash, lies half a cable off Balatacan point; it is difficult to distinguish at high water.

Siokun bay, entered between Balatacan point and Dulunguin point (*Lat. 7° 44′ N., Long. 122° 05′ E.*), 8½ miles northward, affords anchorage to vessels with local knowledge in the northern part, sheltered from north-easterly winds, but necessarily close in on account of the great depth. Siokun river, which has a depth of about 4 feet (1^{m}2) on its bar at half tide, flows out into the northern part of the bay. Launches can ascend the river about 3 miles. A hill, 245 feet (74^{m}7) high, on the northern bank of the river and about 1¾ miles from the entrance, is prominent.

A 16-foot (4^{m}9) patch lies about three-quarters of a mile southward of Dulunguin point, and a group of rocks, 7 feet (2^{m}1) high, lies about 1½ cables offshore and three-quarters of a mile northward of the point.

Chart 957, plan of Port Sta. Maria.

Port Santa Maria.—Port Santa Maria, entered between a point about 1½ miles north-north-eastward of Dulunguin point, and Balangonan point, about 8 cables farther northward, is about 2¼ cables wide between the shoals extending from either side just inside the entrance, with considerable depths in the fairway. It affords the best sheltered anchorage on the west coast of the Zamboanga peninsula, being practically landlocked, with high surrounding hills. The entrance is difficult to distinguish from a distance.

Mount Santa Maria, 646 feet (196^{m}9) high, lies about 7 cables southward of the southern entrance point of the port, and is a good mark. About 4 cables north-north-eastward of it is a hill on which there is a tower, 15 feet (4^{m}6) in height, with a bushy tree growing out of it, and which is easily identified from westward and north-westward. The hills on the northern side of the port are densely wooded. The shores at the entrance to the port are cliffy and rocky, but at the head of the bay there are some sandy bushes. There are no settlements on its shores.

A coral reef extends about 1½ cables northward from the point which projects from the southern side of the port, about three-quarters of a mile south-eastward of the southern entrance point.

Good anchorage may be obtained by vessels with local knowledge, in depths of from 12 to 15 fathoms (21^{m}9 to 27^{m}4), in either bight at the head of the port. The bottom is mud or sand, changing to coral near the shore.

A pier, with a least depth of 11 feet (3^{m}4) alongside, is situated on the northern side of the eastern bight.

Chart 3811.

Coast.—Dangers.—Nunuyan bay, entered between Sampoak point, situated about 1½ miles northward of the southern entrance point of Port Santa Maria, and Nunuyan point, about 1½ miles north-eastward, affords good anchorage during the South-west monsoon.

Baligian bay, entered between Nunuyan point and a point about 1½ miles north-eastward, affords good anchorage to vessels with local knowledge, in depths of from 5 to 15 fathoms (9^{m}1 to 27^{m}4), protected

Charts 943, 1263.

Chart 3811.

from north-eastward. The approach lies southward of Condulingan (Kondulingan) islet, which lies about 6 cables westward of the northern entrance point of the bay with shoal water between. The islet is steep-to, but should be given a berth of about a quarter of a mile.

Coronado bay is entered between Tumao (Tamao) point (*Lat. 7° 52′ N., Long. 122° 10′ E.*), situated about 3½ miles north-north-eastward of the north-eastern entrance point of Baligian bay, and Coronado point, 5¾ miles farther in the same direction. It affords anchorage, in depths of from 10 to 20 fathoms (18^{m}3 to 36^{m}6), protected from north-eastward, close southward of Coronado point. A few streams, some of which are closed in the dry season, flow into Coronado bay, but they can only be entered by small boats at high water. Two shoals, with depths of 10 and 37 feet (3^{m}0 and 11^{m}3) over them, lie 2 miles south-south-westward and south-westward, respectively, of Coronado point, and there are two shoals, with depths of 12 and 25 feet (3^{m}7 and 7^{m}6) over them, lying within three-quarters of a mile of the shore, about 1¼ and 1¾ miles, respectively, southward of the same point.

Sibalic (Sibalik) point, 10 miles north-eastward of Coronado point, is steep-to; the coast in the vicinity is bold, with short stretches of sand and shingle beach between rocky points; large trees and brushwood border the beach. The tops of the higher hills and mountains are densely wooded. The country is sparsely inhabited.

Off-lying islands.—Murcielagos islands are two islands lying on the same reef, about 2¾ miles northward of Quipit (Kipit) point, situated 6¾ miles east-north-eastward of Sibalic point. The eastern and larger island is about 40 feet (12^{m}2) high to the tops of the trees. The reef is steep-to, and close off its eastern end is a shoal with a depth of 10 feet (3^{m}0) over it. Between the reef and the coastal bank, which extends about 1¼ miles northward of Quipit point, there is a deep channel, but in it there is a 39-foot (11^{m}9) patch, situated about three-quarters of a mile southward of the larger island. There are tide-rips eastward of the channel.

Quipit (Kipit) bay, entered between Quipit point and Sawigan point, about 3½ miles eastward, affords anchorage to vessels with local knowledge, protected from south-westward; both entrance points are low, flat and sandy. Quipit (Kipit) river, which flows into the western end of the bay, has a depth of 3 feet (0^{m}9) over its outer bar; small boats may proceed about 2 miles up the river. The best approach to the anchorage is from north-eastward, passing half a mile off Sawigan point. Several shoals, with depths of from 9 to 28 feet (2^{m}7 to 8^{m}5) over them, lie about 1½ miles offshore between the entrance points.

Mount Dansalan, 2,353 feet (717^{m}2) high, and prominent, lies 5 miles south-south-eastward of Sawigan point.

Sindangan bay is entered between Sindangan point, situated about 10 miles north-eastward of Sawigan point, and Lanboyan point, 18½ miles farther in the same direction. Sindangan point consists of undercut cliffs and rocks, from 20 to 50 feet (6^{m}1 to 15^{m}2) high, and steep-to on its eastern side; it is densely wooded and from northward appears to rise gradually to a peak inland about 2,000 feet (609^{m}6) high; from southward and westward this slope appears broken by a series of hills.

A bank, with depths of 3 fathoms (5^{m}5) over it, extends about 1½ cables from the northern and western sides of Sindangan point.

Charts 943, 1263.

Chart 3811.

Palandok point, about 12 miles eastward of Sindangan point (*Lat. 8° 10′ N., Long. 122° 40′ E.*), is a high pebble beach and densely wooded; westward of it there are clay banks, from 15 to 30 feet ($4^{m}6$ to $9^{m}1$) high, and rocky ledges; the coast here is densely wooded to the high-water line. Lanboyan point rises steeply from the water's edge to an elevation of 150 feet ($45^{m}7$) to the tops of the trees which cover the point. There are tide-rips off the point. Conical hills, from about 500 to 800 feet ($152^{m}4$ to $243^{m}8$) high, lie from 2 to 3 miles south-eastward of the point. Southward of Lanboyan point the coast is fringed by a coral reef which extends from one to 1½ cables offshore, with mangrove bushes well outside the high-water line. The eastern and south-eastern shores of the bay are composed of a low sandy beach.

The best protection in Sindangan bay may be obtained in the eastern part off the town of Sindangan, with the tribunal bearing 115°, from half a mile to one mile offshore, in depths of from 4 to 8 fathoms ($7^{m}3$ to $14^{m}6$), mud. The south-eastern corner of the bay is very deep.

About three-quarters of a mile north-eastward of Lanboyan point is Palid point, from which detached rocks and breakers extend 2 cables north-westward. A 2-fathom ($3^{m}7$) patch lies half a mile offshore about one mile northward of the town of Siari, situated on the shores of the bay, about 2 miles eastward of Palid point. This is the only danger along this coast between Palid point and Madalag point, about 6 miles north-north-eastward. Madalag point is 487 feet ($148^{m}4$) high, rocky and very steep, with dark trees covering its seaward side. Anchorage may be obtained close off the coast on account of the great depth between Madalag point and Diwait point, about 5 miles north-eastward.

Diwait point is steep-to with a narrow fringing reef, with Lumayag rock on its edge; this rock has the appearance of a native sail when seen from north-eastward or south-westward. Mount Disacan (Disakan), 1,497 feet ($456^{m}3$) high, about 3½ miles eastward of Diwait point, is the most prominent landmark in the vicinity.

Blanca point, about 2½ miles north-eastward of Diwait point, is one of the most remarkable features of the coast; it is a vertical cliff of white clay, about 50 feet ($15^{m}2$) high, and is formed by a long horizontal table-land covered with grass, but with no trees on it. During the rainy season a stream of water falls from this headland. The coastal bank in the vicinity of the point extends about 2 cables offshore, with a depth of 2 fathoms ($3^{m}7$) at its outer edge. The land in the interior in this vicinity is mountainous, and there are many small peaks and ridges which are densely wooded. Between Blanca point and Dohinog, about 8½ miles eastward, the coastal bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends about half a mile offshore.

The bay entered between Blanca point and Sicayac (Sikayak) point, about 19 miles north-eastward, is deep and free from dangers. The villages of Dohinog, Langatian and Lubungan, on the southern shore, and Sicayac (Sikayak), on the point of the same name, are small and unimportant. Dipolog, the largest town in this vicinity, is situated on the southern side of the mouth of the river of the same name, about 2¾ miles southward of Sicayac point. There is a shallow bar at the entrance to Dipolog river, but a small boat can enter at high water. Anchorage may be obtained anywhere westward of the town according to draught, depths of 5 fathoms ($9^{m}1$) being found about 4 cables

Charts 3809, 3827, 943, 1263.

Chart 3811.

offshore. Off Lubungan and Langatian it is necessary to anchor very close in on account of the great depth. Sicayac point (*Lat. 8° 38′ N., Long. 123° 21′ E.*) is fringed by rocks above water which extend about 1¾ cables westward, beyond which shoal water extends about 1¼ cables.

Chart 957, plan of Dapitan bay.

Dapitan bay. — Dangers. — Light. — Dapitan bay is entered between Botogan point, which is fringed by a narrow reef, situated about 1¾ miles north-eastward of Sicayac point, and Tagolo point, about 5 miles northward. Tagolo point, about 100 feet ($30^{m}5$) high, is fringed by a narrow steep-to reef. About 1¼ miles south-eastward of the point the land rises to an elevation of 920 feet ($280^{m}4$), and is densely wooded. The tidal streams set eastward and westward at a considerable rate off Tagolo point.

A light is exhibited, at an elevation of 109 feet ($33^{m}2$), from a white concrete house, on Tagolo point.

Tubud point, 1¼ miles southward of Tagolo point, is formed by a prominent isolated hill, and is fringed by a reef which extends northward to Tagolo point and about a quarter of a mile offshore. Liuay rock, a flat rock, which dries about 4 feet ($1^{m}2$), lies about 3 cables westward of Tubud point. About 2¾ miles south-eastward of Tubud point is Estacion point, close westward of which is an islet, and 2 cables south-south-westward of the islet is a coral reef with a least depth of 4 feet ($1^{m}2$) over it, and depths of over 3 fathoms ($5^{m}5$) between the reef and the point.

Port Talaguilong, entered 1½ miles south-eastward of Tubud point, is about 1½ cables wide at its entrance, with a depth of 4½ fathoms ($8^{m}2$) in the middle. Close inside there is an anchorage space about 4 cables in extent, with a least depth of 4¾ fathoms ($8^{m}7$). Good anchorage may also be obtained north-eastward of the islet situated on the western side of the port.

Dapitan river, which flows into Dapitan bay about three-quarters of a mile south-eastward of Estacion point, has a shallow bar, but at high water and with a smooth sea small lighters can enter. The town of Dapitan, in which there is a prominent church with two pyramidal spires and an iron roof, is situated on the left bank of the river, about half a mile southward of the southern entrance point.

There is a concrete pier, 150 feet ($45^{m}7$) long, at Port Puluan, on the southern side of Dapitan bay, about 9 cables south-eastward of Botogan point, with a depth of 27 feet ($8^{m}2$) at its head.

Anchorage.—The usual anchorage is in a depth of 3½ fathoms ($6^{m}4$) mud, from 4 to 5 cables offshore, with the church bearing 092°, but good anchorage may be obtained in any part of the bay, sheltered from all except north-westerly winds. A good anchorage may be obtained, in a depth of 7 fathoms ($12^{m}8$), about 4 cables southward of the small islet off Estacion point, with the river mouth bearing 092°.

Charts 3827, 3811, 3809.

Off-lying island and dangers.—Aligbay (Aligbai) island, 9 miles westward of Tagolo point (*Lat. 8° 44′ N., Long. 123° 22′ E.*), is about 100 feet ($30^{m}5$) high and wooded. A steep-to coral reef extends about a quarter of a mile from its north-western side, and shoal water about half a mile from its eastern side.

Challenger reef, 2 miles south-south-eastward of Aligbay island, is of coral with a depth of 21 feet ($6^{m}4$) over it.

Charts 943, 1263.

Charts 3827, 3811, 3809.

Don reef, with a depth of 12 feet ($3^{m}7$), coral, over it, and steep-to, lies about 4¼ miles west-north-westward of Botogan point.

Chart 961.

SOUTHERN SIDE OF MINDANAO.—Tictauan channel.—Dangers.—Buoy.—Tictauan (Tiktauan) channel, between Tictauan (Tiktauan) island and the southern end of Zamboanga peninsula, is 5½ cables wide at its narrowest part. A 16-foot ($4^{m}9$) patch of sand and coral lies in the south-western entrance about 4 cables from the north-western shore. Tictauan shoal, with a least depth of 18 feet ($5^{m}5$) over it, sand and coral, and marked on its north-western side by a red conical buoy, lies in the middle of the channel 2 miles east-north-eastward of Mariqui point, and is generally marked by tide-rips. The wider and better channel lies north-westward of it.

Anchorage.—Directions.—Good anchorage may be obtained in Tictauan channel, in depths of from 10 to 14 fathoms ($18^{m}3$ to $25^{m}6$), but the tidal streams are strong.

A vessel entering the channel from southward should steer for the south-eastern extremity of Balabac (Balabak) island, situated on the north-western side of the channel northward of the eastern end of Tictauan island, bearing 050°, until abeam of the south-western extremity of Tictauan island, when she should steer 042°, which leads north-westward of Tictauan shoal.

Masinloc anchorage. — Buoys. — Masinloc (Masinlok) anchorage is the name given to the channel between Sacol (Sakol) island, situated about 1¾ miles north-eastward of Tictauan island, and the south-eastern side of Zamboanga peninsula, and it may be considered a prolongation of Tictauan channel. It is about half a mile wide at its narrowest part and deep in the fairway.

Masinloc river, which flows into the anchorage westward of the southern extremity of Sacol island, has a least depth of 13 feet ($4^{m}0$) on its bar; it is very narrow and of little commercial importance. Masinloc (Masinlok) village is situated on the southern side at the mouth of the river. There is a concrete pier, 216 feet ($65^{m}8$) long at its face, with a depth of 31 feet ($9^{m}4$) alongside.

Pilots meet incoming vessels outside the entrance.

Two black can buoys mark the eastern edge of the shoals at the mouth of the river. One is moored about one mile east-north-eastward and the other about three-quarters of a mile eastward of Masinloc village.

Between the entrance to the river and the northern entrance to Masinloc (*Lat. 6° 55′ N., Long. 122° 09′ E.*) anchorage the coast is low, bordered with mangroves, and fringed with reef. About 2 miles northward of the northern entrance point of the river the coastal reef dries and widens, gradually extending to a distance of about half a mile offshore.

Sacol island is low in its western part, and consists mostly of mangrove swamps; in the eastern part there are two prominent hills, the higher and southern, known as Sacol (Sakol) hill, having an elevation of 781 feet ($238^{m}0$). From a distance the hills appear as two islands; Sacol hill is a good mark when approaching from northward or eastward. The north-western side of the island, at its southern end, is clear and steep-to, but at the northern end a bank, with a depth of 1¾ fathoms ($3^{m}2$) over it, extends half a mile offshore. The northern

Charts 928, 2576, 943, 1263.

Chart 961.

and eastern sides of the island are fringed with a steep-to reef; from the south-eastern side a coral reef, which dries, extends from about 2 to 7 cables offshore, and a bank, with depths of less than 6 fathoms (11^{m}0) over it, extends about 2 miles.

Pangaypuyan island, covered with coconut trees, lies close off the south-western point of Sacol island. A reef, with a depth of 2 fathoms (3^{m}7) over it near its outer end, extends about 4 cables south-westward from the island. The channel between Pangaypuyan and Tictauan islands is encumbered with shoals and is not recommended for vessels without local knowledge.

In the northern entrance to Masinloc anchorage there are several shoals, which divide it into two channels; the western channel is about 3½ cables wide with a depth of 5½ fathoms (10^{m}1), and the eastern is half a mile wide and a least depth of 6 fathoms (11^{m}0). In the western channel there is a rock above water situated about 3¾ miles west-north-westward of the northern point of Sacol island, and there are several shoals, with depths of from 6 to 15 feet (1^{m}8 to 4^{m}6) in that vicinity. In the eastern channel there is a 3-foot (0^{m}9) patch about 2 miles westward of the same point.

Good anchorage may be obtained anywhere in Masinloc anchorage, in depths of from 6 to 12 fathoms (11^{m}0 to 21^{m}9), completely sheltered from wind and sea. The tidal streams set south-westward and north-eastward, turning at the same time as off Zamboanga.

Off-lying islands and dangers. — Sinonog island, 2¾ miles south-eastward of the eastern extremity of Sacol island, is low except on its eastern side, where there is a cliff, 100 feet (30^{m}5) high; it is fringed by a reef which extends about 3 cables east-north-eastward. A 28-foot (8^{m}5) patch of black and white sand lies about 1½ miles eastward of Sinonog island.

Tulnalutan island, 200 feet (61^{m}0) high, lies about 3¾ miles eastward of Sacol island. A reef, on which lies a small islet, extends about 3 cables from the eastern side of the island.

Angosto shoal, with a depth of 9 feet (2^{m}7) over it, coral and sand, lies about 3¾ miles east-north-eastward of Tulnalutan island.

Roldan rock, with a depth of 4 feet (1^{m}2) over it, and steep-to, lies about 2½ miles north-north-eastward of the northern extremity of Sacol island.

Chart 3811.

SIBUGUEY BAY.—Dangers.—Sibuguey bay lies with its entrance between Sacol island and Lutangan island, about 38 miles east-north-eastward, and extends northward on the eastern side of Zamboanga peninsula. Sharp peak, 2,471 feet (753^{m}1) high, is the highest peak of a ridge, and lies about 34 miles northward of the southern extremity of Zamboanga peninsula. There is another peak of lower elevation southward of it. Mount Sibuguey is the most prominent peak on the eastern side of the bay. *See* page 256.

Lying across the entrance and extending about 24 miles north-eastward of Sacol island, are eight distinct detached shoals, besides Angosto shoal (*Lat. 7° 00′ N., Long. 122° 25′ E.*), which is described above. The outer shoal, with a depth of 16 feet (4^{m}9) over it, lies about 18 miles east-north-eastward of Tulnalutan island, and between this shoal and the Zamboanga peninsula westward are two shoals,

Charts 928, 2576, 943, 1263.

Chart 3811.

with depths of 8 and 12 feet (2^{m}4 and 3^{m}7) over them, respectively, with a 34-foot (10^{m}4) patch between them. A 13-foot (4^{m}0) patch and a 17-foot (5^{m}2) patch lie about 3¾ and 7¾ miles, respectively, north-north-eastward of the 8-foot (2^{m}4) shoal. They consist of coral and white coral sand and are steep-to. In a favourable light they can usually be discerned by the discoloration, but this should not be relied on, for often the coral heads, over which there is the least depth, are dark coloured and do not show up so well as the sand on those with a greater depth.

Western side of Sibuguey bay.—Coast.—From the northern entrance to Masinloc anchorage to Vitali point, about 25 miles north-north-eastward, the coast is indented by several small bays, most of which are foul and of no importance to navigation. Several streams, none of which is navigable, flow out, and there are some small villages on the coast.

The coast is fringed in places by coral reefs and fronted by several islands, most of which are clear of dangers on their seaward sides.

Malasugat point, about 10½ miles north-north-eastward of the northern entrance point of Masinloc river, is low, wooded, and fringed by a narrow reef. Malasugat bay, south-westward of Malasugat point, is nearly blocked by reefs. A one-fathom (1^{m}8) patch lies 1½ miles southward of Malasugat point and one mile offshore, and a 22-foot (6^{m}7) patch lies about 1¼ miles southward of the same point.

Panubigan islands are a group of about 20 small islands and rocks lying off the coast between Malasugat point and Lawigan point, 6¾ miles northward, and within a distance of 2 miles of the coast. They are generally high and well wooded. Sheltered anchorage may be obtained among them by vessels with local knowledge.

Off-lying danger.—A shoal, with a depth of 28 feet (8^{m}5) over it, and steep-to, lies 6½ miles south-eastward of Taguite point, situated 8 miles north-north-eastward of Lawigan point.

Coast.—About 5 miles northward of Lawigan point is Bluff point, and between the latter and Taguite point is the entrance to Taguite bay. In the middle of the bay and close off the northern shore is Taguite island, 215 feet (65^{m}5) high, and wooded. The bay is shallow and is of no value to navigation. Mount Taguite, 1,400 feet (426^{m}7) high, wooded, and prominent, lies about one mile north-north-westward of Bluff point; it has steep symmetrical slopes with a rounded dome-shaped summit and is the highest mountain near the coast in this vicinity.

Between Taguite point and Vitali point (*Lat. 7° 23′ N., Long. 122° 23′ E.*) the coast is densely wooded from the inner edge of the mangroves as far as can be seen, except near Vitali point, where the low hills are covered with grass. A prominent house stands on Vitali point. This part of the coast is fringed by a narrow coral reef. About 1¼ miles south-south-westward of Vitali point there is a small, low, wooded islet lying on the coastal reef. A rock, awash, and steep-to, lies about 6½ cables south-south-eastward of Vitali point and about half a mile offshore.

Off-lying islands.—Tigbauan (Tigbaon) islands are a group of five islands and one rock lying eastward and south-eastward of Vitali point. Tigburacao (Tigburakao), the south-easternmost of the group, is a low, flat, densely wooded island, lying about 3¾ miles south-eastward of

Charts 943, 1263.

Chart 3811.

Vitali point; it is fringed by a narrow reef, widest on the western side. Two large pinnacle rocks, the higher of which has an elevation of 40 feet (12$^{\mathrm{m}}$2), lie about half a cable south-eastward of this island. These rocks are very prominent; when seen from south-westward they appear as one.

White rock, one foot (0$^{\mathrm{m}}$3) high, lies on a small coral reef, which is steep-to, about 6 cables west-south-westward of Tigburacao island.

Gatusan islands, about 1¾ miles south-south-eastward of Vitali point, are two wooded islands fringed with rocks; the northern island is less than 50 feet (15$^{\mathrm{m}}$2) high, while the southern rises to an elevation of 117 feet (35$^{\mathrm{m}}$7).

Bacungan (Bakungan) island (*Lat. 7° 23′ N., Long. 122° 25′ E.*), 211 feet (64$^{\mathrm{m}}$3) high, lies about 2¼ miles eastward of Vitali point; its sides are fairly bold. A rock, awash, lies 3¾ cables south-westward of Bacungan island, with a deep and clear channel between.

Lapinigan island, 192 feet (58$^{\mathrm{m}}$5) high, and densely wooded, lies about 6 cables north-eastward of Vitali point. Rocks, which dry, extend about a quarter of a cable from the southern and eastern sides of the island. There is a least depth of 2¾ fathoms (5$^{\mathrm{m}}$0) in the channel between Vitali point and the island. Seen from southward the island appears like a cone with a steep slope on the eastern side and a gradual rise on the western. A shoal, with a depth of 13 feet (4$^{\mathrm{m}}$0) over it, lies about three-quarters of a mile eastward of Lapinigan island.

Tungauan bay.—Tungauan (Tunganan) bay is 7 miles wide at its entrance between Vitali point and Linguisan point, north-north-eastward of it. Near the coast are some hills, from about 240 to 490 feet (73$^{\mathrm{m}}$2 to 149$^{\mathrm{m}}$3) high, separated by deep winding valleys; farther inland the land rises in a series of hills to the mountains in the interior. Cone hill, 750 feet (228$^{\mathrm{m}}$6) high, lies 5¼ miles west-north-westward of Vitali point. The seaward side of the hill is covered with tall grass, and presents a sharp contrast against the surrounding background, and is an excellent mark when approaching the bay from eastward.

The depths decrease gradually towards the western shore, where there are extensive mud flats. Nearly the whole bay has a mud bottom, but in the few places where the depth is over 10 fathoms (18$^{\mathrm{m}}$3) the bottom is sandy.

Cabog and Camugan islands, about 50 feet (15$^{\mathrm{m}}$2) high, and wooded, and a wooded islet, 20 feet (6$^{\mathrm{m}}$1) high, lie on the same reef on the outer edge of the coastal bank, about 1½ miles north-westward of Vitali point.

Basan reef is a dangerous detached coral reef, which dries about 3 feet (0$^{\mathrm{m}}$9), lying about 2 miles northward of Vitali point. The northern and eastern sides of the reef are steep-to, and may be approached with safety, but the southern and western sides are foul. On the two highest parts of the reef banks of white sand have formed and are visible from a considerable distance except at extreme high water.

Tigbucay bay is a small inlet lying on the western side of Tigbucay point, situated at the northern end of Tungauan bay, about 2 miles west-south-westward of Linguisan point. The southern part of Tigbucay bay is deep and clear of dangers, but the northern part is very shallow.

Anchorage.—Anchorage may be obtained by vessels with local knowledge anywhere in Tungauan bay, in a depth of 10 fathoms

Charts 943, 1263.

Chart 3811.

$(18^{m}3)$, mud, northward of the parallel of Basan reef, except at the northern part, where the depths are slightly greater.

Port Banga.—Dangers.—Port Banga is 2 miles wide at its entrance between Tigbucay and Linguisan points. It affords good anchorage, protected from all winds and is navigable for a distance of 2 miles from the entrance for large vessels, and nearly to its head for small craft.

Linguisan point (*Lat. 7° 30′ N., Long. 122° 26′ E.*), low and wooded, is fringed by a reef which extends from 1½ to 2 cables offshore. Eastward of the point and along the southern side of the peninsula which forms the south-eastern side of the port, there is a coral shelf, which partly dries, extending from about half a cable to 3 cables offshore. The eastern extremity of this shelf is marked by rocks above water.

A dangerous detached coral reef, which dries, lies about one mile south-eastward of the south-eastern point of the peninsula of which Linguisan point is the south-western extremity.

Bangaan island, 160 feet $(48^{m}8)$ high, and sparsely wooded on the slopes, lies about the middle of the entrance, with a navigable channel on either side of it leading into the port. It is fringed by a reef, which, from the south-eastern side, extends about 2 cables and dries, with a bank, with depths of less than 3 fathoms $(5^{m}5)$ over it, extending one cable beyond. From the south-western point a rocky ledge extends about 4½ cables. This point should be given a good berth as the ledge is steep-to, and at high water the ledge is covered.

On the northern end of Bangaan island there are the ruins of a wharf.

A 4-fathom $(7^{m}3)$ patch lies about midway between Dandulit point, the eastern extremity of Bangaan island, and the reef extending south-westward from Linguisan point, and a 28-foot $(8^{m}5)$ patch lies about 3 cables west-south-westward of Linguisan point.

On the north-western side of the port, and on the edge of the coastal bank, about 2¼ cables offshore and about one mile northward of Linguisan point is Lampinigan island, 106 feet $(32^{m}3)$ high and densely wooded. North-westward of a line running south-west and north-east from the south-eastern side of this island there is foul ground with some coral patches, which dry, north-eastward of the island. On the south-eastern side of the port is a coral patch, with a depth of 3 feet $(0^{m}9)$ over it, lying half a mile south-south-eastward of Lampinigan island and about a quarter of a mile from the south-eastern shore; but for this danger the south-eastern shore is clear nearly to the edge of the fringing coral reef except off Linguisan point.

Anchorage.—Directions.—Anchorage may be obtained by vessels with local knowledge in Port Banga, between Bangaan island and a line drawn eastward from Lampinigan island, in depths of from 7 to 11 fathoms $(12^{m}8$ to $20^{m}1)$, mud.

To enter Port Banga by the western channel, a vessel should give the south-western extremity of Bangaan island a berth of at least half a mile, and when the channel is well open and Lampinigan island beginning to be shut in by the point on the western side of the port, about 1¼ miles south-westward of it, she should steer up the channel with that point a little on the starboard bow, keeping towards the western shore; when she is clear of the north-western point of Bangaan island she should alter course north-eastward, and proceed up the middle of the port.

To enter by the eastern channel, the vessel should bring the north-

Charts 943, 1263.

Chart 3811.

eastern point of Bangaan island to bear 295° before Buluan island (page 253) is shut in by the land, and steer for the point on that bearing; on nearing the point she should alter course northward and pass it at a distance of from one to 1½ cables; when the western entrance channel begins to open she should alter course north-eastward and steer up the middle of the port to the anchorage.

Coast. — Between Linguisan point and Bagolibud point (*Lat. 7° 34′ N., Long. 122° 30′ E.*), about 6½ miles north-eastward, the coast is well-defined by numerous cliffy points with sandy beaches in the indentations between them. The southern part of the peninsula, which forms the south-eastern side of Port Banga, is covered with tall grass and a few scattered trees; on the northern part are low, wooded hills, the north-easternmost of which is 183 feet ($55^{m}8$) high, and forms the summit of Bagolibud point. This stretch of coast is fringed by a narrow strip of coral, and the only detached danger is a shoal with a depth of 3 feet ($0^{m}9$) over it, situated 1¼ miles southward of Bagolibud point, and about 3½ cables offshore.

Panabulan islet, 3 miles south-westward of Bagolibud point, is fringed by a reef which connects it with the coast of Mindanao, about 1½ cables distant. Loclabuan bay is a small inlet entered about 9 cables southward of Bagolibud point. On the northern side of the bay there is a prominent densely wooded hill, 244 feet ($74^{m}4$) high, the greatest elevation in the vicinity.

Busan bay.—Dangers.—Busan bay lies with its entrance between Bagolibud point and Laboyoan point, 7 miles northward. Tupilac hill, 517 feet ($157^{m}6$) high, situated about 3¼ miles south-westward of Laboyoan point and about 1¾ miles inland, is the most conspicuous feature in the vicinity of the bay; it is a conical grassy hill, and, having a wooded background, can be seen from a considerable distance. Three other grassy hills lie south-westward of Tupilac, and numerous low hills with grassy slopes lie around the south-western shore of the bay. These hills are separated from the higher and more distant hills in the interior by a valley leading inland in a westerly direction from Calug (Kalug) point, situated 4¼ miles south-south-westward of Laboyoan point. A similar valley extends from the southern shore of Busan bay to Port Banga.

Bagolibud point is a densely wooded narrow neck of land. Foul ground extends a quarter of a mile eastward from the point and the northern side is fringed by a reef and bordered with mangroves. About 1¼ cables northward of the point are the Tatal rocks, from 10 to 13 feet ($3^{m}0$ to $4^{m}0$) high, which are connected to the point by a reef which dries; these rocks are very noticeable from seaward. Padugan islet, 20 feet ($6^{m}1$) high, lies on the outer edge of the coastal reef which dries, about 3½ cables westward of Bagolibud point.

Lalim point, about 1¾ miles westward of Bagolibud point, is fringed by a coral reef which extends a quarter of a mile northward from it. The south-western corner of Busan bay is entirely filled by coral reefs awash. Saduc islet is a clump of mangroves growing on these reefs about 1½ cables offshore. Calug point is fringed by a coral reef which extends about half a mile south-eastward; all but the outer extremity of it is awash. Northward of the point the shore is fringed by coral except in the bight on the northern side of the point and in the bight westward of Buluan island (page 253).

Charts 943, 1263.

Chart 3811.

Laboyoan point is covered with mangroves and indicates the position of the mouths of two small rivers. It is fringed by coral reefs which extend over half a mile south-eastward. About 4 cables southward of the outer edge of this reef there is a shoal with a depth of 19 feet ($5^{m}8$) over it. A rock, awash, lies off the edge of the reef, about one mile south-south-westward of Laboyoan point.

Off-lying islands.—Diligan island (*Lat. 7° 35′ N., Long. 122° 29′ E.*), about 1¼ miles north-westward of Bagolibud point, is low and densely wooded ; it is fringed by a narrow steep-to coral reef, but may be safely rounded at a distance of a quarter of a mile.

Buluan island, with a sharp, densely wooded peak, 324 feet ($98^{m}8$) high, lies about one mile east-south-eastward of Laboyoan point, with a channel a quarter of a mile wide between, and depths of from 8 to 10 fathoms ($14^{m}6$ to $18^{m}3$) in the middle. The island is the largest and most prominent in the northern part of Sibuguey bay. The eastern, southern, and south-western sides are fringed with coral, which dries, and rocks, which dry about 6 feet ($1^{m}8$), lie 1¼ cables south-eastward of the island ; this is the only part of the island which is not steep-to.

Anchorages.—Anchorage may be obtained by vessels with local knowledge anywhere in Busan bay. There is a good anchorage, in depths of from 6 to 7 fathoms ($11^{m}0$ to $12^{m}8$), mud, between Lalim point and the reefs extending from the south-western corner of the bay.

Coast.—Buluan river, with the village of the same name on the southern side of its entrance, flows out about 1¼ miles north-north-eastward of Laboyoan point. About 1¾ miles farther north-eastward is Caparan (Kaparan) village, standing on a low islet in the midst of mangroves ; there is a sandy beach on the southern side of the islet. Madiaop point, 4½ miles north-eastward of Laboyoan point, is fringed by a narrow belt of mangroves and numerous rocks awash.

Mount Silingan, about 5½ miles west-north-westward of Madiaop point, is a prominent mark from all parts of Sibuguey bay. It has three prominent peaks and a lesser one rising from its northern shoulder. Quipit (Kipit) peak, 2,950 feet ($899^{m}2$) high, is the central and highest, and Matanog peak, 2,431 feet ($741^{m}0$) high, lies about one mile north-eastward of it.

Saro point, 1½ miles east-north-eastward of Madiaop point, consists of low cliffs, and marks the eastern limit of the low, irregular, grass-covered hills which extend in a south-westerly direction towards Madiaop point.

Bacalan (Bakalan) point, about 1¼ miles east-north-eastward of Saro point, is about 10 feet ($3^{m}0$) high, covered with small trees and brushwood, and is connected with the mainland by an extensive mangrove swamp. The southern extremity of the point is composed of low cliffs, and a gravel beach borders the eastern part. Between Bacalan point and Taynabo point, about 3¼ miles eastward, there is a bay, the inner part of which is composed of mud flats which dry. The head of the bay is bordered with mangroves, and several small streams flow into it. Coba islet, 30 feet ($9^{m}1$) high, and wooded, lies on the mud flat and 2 cables offshore, about 1¼ miles north-eastward of Bacalan point.

Taynabo point (*Lat. 7° 46′ N., Long. 122° 40′ E.*) is the most prominent point at the head of Sibuguey bay ; its southern and eastern sides

Charts 943, 1263.

Chart 3811.

are composed of cliffs about 15 feet (4^{m}6) high, and on the south-eastern side there is a sandy beach. The southern part is densely wooded; the eastern part is covered with grass and brushwood, and rises to an elevation of 165 feet (50^{m}3). The point is connected to the mainland by a narrow neck consisting of mangroves.

Eastern side of Sibuguey bay.—Dangers.—Lutangan island, the eastern entrance point of Sibuguey bay, lies on the south-eastern edge of the reef, which partly dries, and which extends about 1¼ miles from the southern side of Seboto point, the southern extremity of Olutanga island. The island is low and densely wooded, and is nearly connected to Olutanga by a mangrove swamp. Its south-eastern side is bordered by low cliffs and a sandy beach; the other sides are fringed with mangroves; the eastern extremity is steep-to.

A 4-fathom (7^{m}3) patch lies about three-quarters of a mile southward of Lutangan point, the southern extremity of Lutangan island, and a 5-fathom (9^{m}1) patch lies 1½ miles south-south-westward of the same point, and about 6 cables outside the reef which extends southward from Seboto point.

Olutanga island.—Olutanga island lies immediately southward of the peninsula forming the eastern side of Sibuguey bay; it is separated from the mainland by Port Sibulan, entered from eastward, and by Canalizo strait, a narrow tortuous channel which connects that port with Sibuguey bay. The western coast of the island is fairly regular; on the south-eastern and northern sides, respectively, are Pongca (Pongka) (page 257) and Tumalung (page 261) bays. The island is low and flat, generally fringed with mangroves, and heavily wooded in the interior.

There is a long, densely wooded ridge, the highest part of which has an elevation of 370 feet (112^{m}8) to the tops of the trees, situated northward of Cangan (Kangan) point, about the middle of the southern side of the island. On this ridge is a prominent single tree which may be seen from all directions.

Seboto point is bordered by a white sandy beach, and is densely wooded; there is a small village on the point. Deal point, the western extremity of Olutanga island, is low, densely wooded, and fringed with a narrow belt of mangroves. Between these two points Tambanon and Gandaan rivers flow out. A depth of 8 feet (2^{m}4) can be carried in a narrow channel in the entrance to Gandaan river and for 2 miles up. The entrance to Tambanon river is encumbered with reefs which dry. Between Deal point and the western entrance to Canalizo strait, the coast is fringed by a comparatively narrow belt of mangroves, intersected by several small streams. The coastal reef extends nearly half a mile offshore and there are several detached reefs, which dry, lying about 2 miles offshore. Lipari island covered with mangroves, lies less than half a mile offshore about 2 miles northward of Deal point (*Lat. 7° 21′ N., Long. 122° 47′ E.*); it is fringed by a wide reef, and there is foul ground between it and Olutanga island.

Canalizo strait is only available for small craft with local knowledge. A depth of 7 feet (2^{m}1) can be carried through, but the western entrance is only half a cable wide between coral heads; it is marked by a small mangrove islet lying on the northern side about 1¼ cables offshore.

Off-lying islet and dangers.—East Circe shoal, with a depth of

Charts 943, 1263.

Chart 3811.

16 feet (4^{m}9) over it, and steep-to on its northern side, lies about 7 miles westward of Seboto point.

West Circe shoal, with a depth of 3 fathoms (5^{m}5) over it, and steep-to, lies 3½ miles westward of East Circe shoal.

A 25-foot (7^{m}6) patch lies 2½ miles off the western side of Olutanga island and 3¼ miles south-westward of Deal point. A 27-foot (8^{m}2) patch lies about 3½ miles westward of the same point. A bank, with depths of less than 10 fathoms (18^{m}3) over it, lies about 5 miles westward of, and parallel with, the west coast of Olutanga island; at its northern extremity, situated about 4½ miles west-north-westward of Lipari island, is a 10-foot (3^{m}0) patch, and about 1½ miles southward of it is a 22-foot (6^{m}7) patch. A 5-fathom (9^{m}1) patch lies one mile westward of this bank, and 6¼ miles westward of Lipari island. It is marked by discoloration.

Pandalusan islet, 72 feet (21^{m}9) high, and wooded, lies 7¼ miles north-westward of Lipari island. A coral reef, awash, extends 2 cables south-westward from the islet, and another, nearly awash, extends about the same distance eastward. A bank, with a least depth of 1½ fathoms (2^{m}7) over it near its extremity, extends 1½ miles eastward from the islet.

Between Pandalusan islet and the eastern shore of Sibuguey bay there are numerous sunken dangers, the positions of which may best be seen on the chart.

North-west rock, 2¼ miles north-westward of Pandalusan islet, is awash. It is not easily distinguished, and vessels should keep well over towards Pandalusan islet and not attempt to pass westward of the reef.

Coast.—Dangers.—Locsico (Loksiko) bay is entered between the northern entrance point of Canalizo strait and Talaid point, about 3 miles north-westward. Its entire shore is bordered with mangroves and fringed with coral reefs. From Topocan point, a mangrove-covered point at the head of the bay, a reef extends southward and divides the bay into two arms, which are only available for small vessels with local knowledge. The main part of the bay is encumbered with detached coral reefs, parts of which dry. Talaid point is fringed by a narrow belt of mangrove, inside which the land is low and densely wooded. The point is bordered by a reef which extends nearly one mile south-westward from it.

Between Talaid point (*Lat. 7° 28′ N., Long. 122° 47′ E.*) and Ticauan (Tikauan) point, about 17 miles northward, mangrove swamps fringe the coast and completely obscure the coastline except at one point off the village of Bagalamatan in Taba bay, at Patan point, about 7 miles northward of Talaid point, where the mangrove belt is very narrow, and at Lambayogan point, about 1½ miles farther northward. At the latter point and the point in Taba bay the coast is rocky or sandy and free from mangroves.

Between Talaid point and Cabog point, 4½ miles northward, the coast is fringed by reefs which extend one mile offshore in places; beyond this reef there are numerous detached reefs lying within 1½ miles of the coast, the positions of which may be seen on the chart. Labatan hill, a densely wooded, dome-shaped hill, 440 feet (134^{m}1) high, lies near the coast about midway between Talaid and Cabog points. It is the only hill southward of Mount Sibuguey, and is consequently easy to identify from any part of the bay.

Charts 943, 1263.

Chart 3811.

Off-lying danger.—A coral reef, awash, and steep-to, lies 4½ miles westward of Cabog point. On the northern part of the reef is a white coral sand cay, which usually dries about 6 feet (1^m8); its shape and position on the reef change with every storm.

Taba bay.—Taba bay, entered between Cabog point, and Patan point, is the best sheltered anchorage on the eastern side of Sibuguey bay. About 3½ cables northward of Cabog point are the Cabog islands, two small islands, covered with mangroves, lying close together on the same reef. This reef, part of which dries, extends northward to within about 6 cables south-westward of Patan point. Within a mile outside this reef there are several detached patches of reef which dry. The edge of this reef and also that of the reef which fringes Patan point are easy to distinguish at low water. The navigable channel between them is about 3½ cables wide. There are two small detached coral reefs which dry, lying about three-quarters of a mile and 1½ miles south-eastward of Patan point, and about 4 and 2 cables, respectively, from the eastern shore. These detached reefs can usually be discerned by the discoloration of the water over them.

Patan point rises to an elevation of 244 feet (74^m4) about 2 cables eastward of its extremity. The southern slope of the hill is covered with tall grass, but the other parts are densely wooded, as is also the low land farther eastward. Low cliffs form the southern side of the point.

The depths in the entrance are from 12 to 16 fathoms (21^m9 to 29^m3), and for a distance of 1¾ miles within they decrease gradually to 5 fathoms (9^m1). The head of the bay is shallow, and in the south-eastern corner are mud flats which dry.

The shores of the bay are generally bordered with mangroves and fringed with narrow reefs. Bagalamatan is the principal village in the bay; it is situated on cliffs about 35 feet (10^m7) high, on the eastern shore about 2 miles south-eastward of Patan point. Payao village stands about a mile south-eastward of the same point. Suong island, covered with mangroves, lies at the head of the bay.

Directions.—To enter Taba bay a vessel should steer 137°, passing about a quarter of a mile from Patan point, and when the eastern extremity of the Cabog islands bears 180° she should steer 160° and anchor according to draught.

Coast.—Between Patan point (*Lat. 7° 36′ N., Long. 122° 47′ E.*) and Ticauan point the coast is free from off-lying dangers, but is fronted by extensive mud flats, which dry and are steep-to, and may be approached to a distance of one mile except off the mouth of Siay river, where a bank, with depths of less than 3 fathoms (5^m5) over it, extends as far as 2 miles southward of Ticauan point, and 2½ miles from the coast on the southern side of the mouth of the river.

Mount Sibuguey, 1,050 feet (320^m0) high, lies about 1¾ miles east-north-eastward of Patan point; it is usually visible from the entrance, and is easy to identify.

Sibuguey river, which nearly dries at its mouth, flows out about 3 miles northward of Patan point. About 4 miles farther northward the Pamandian river flows out; there is a depth of 5 feet (1^m5) on the bar and considerably more inside.

Siay river, the largest and only river of any importance in this region, flows into the north-eastern corner of Sibuguey bay. A clear

Charts 943, 1263.

but narrow and tortuous channel, with a least depth of 8 feet ($2^{m}4$), winds through the mud flats of the bay to the mouth of the river. The river has been ascended a distance of 3 miles by steam launch and no obstructions were found. Cabut (Kabut) island, forming the western side of the mouth of the river, is connected to the mainland southward of it at low water.

Ticauan point is, with the exception of two small inconspicuous areas of dry land, covered with mangroves. The coastal bank extends about half a mile westward from the point. Between Ticauan point and Taynabo point, 4½ miles west-north-westward, there is a bay, from the head of which Banco and Tando points project southward, dividing it into three smaller bays. Both of these points are fringed with coral, but the bays are comparatively clear of dangers. Villages are situated on the shores of the bays and on Taynabo point.

Banco point, 2½ miles north-westward of Ticauan point, terminates in a sharp point bordered by several rocks, awash. It is densely wooded and rises to an elevation of 100 feet ($30^{m}5$) on the south-western side, and slopes gradually north-eastward. Mangrove swamps northward and north-eastward of the point separate it entirely from the mainland.

Tando point, one mile westward of Banco point, terminates in low cliffs, and rises to an elevation of 211 feet ($64^{m}3$) at a short distance from its extremity. Numerous rocks, awash, lie off the southern end of the point, and 2 cables southward of it is a rock, about 15 feet ($4^{m}6$) high.

A reef, with a depth of about one foot ($0^{m}3$) over it, lies about 1¼ miles southward of Tando point; between the reef and the 15-foot ($4^{m}6$) rock, there is a clear channel, about 6¼ cables wide, with a depth of 9 fathoms ($16^{m}5$) in the fairway.

About 1½ miles north-westward of Tando point is one of the most prominent hills at the head of Sibuguey bay. It is densely wooded, detached from the higher hills of the interior, and has two similar shaped peaks, the south-western and higher of which has an elevation of 696 feet ($212^{m}1$).

SOUTHERN SIDE OF MINDANAO (*continued*).—**Coast.**—Between Seboto point (*Lat. 7° 17′ N., Long. 122° 49′ E.*) and Taguisian point, the eastern extremity of Olutanga island, the south-eastern coast is fringed by reefs which dry. Between these points there are two other fairly prominent projections, Cangan (Kangan) and Sarva points, between and on either side of which are bays; that between Sarva and Taguisian points is known as Pongca (Pongka) bay, and is about one mile wide, but is encumbered with dangers, and affords no anchorage.

Silagui islet, lying on the same reef as Lutangan island and about 6 cables northward of it, is low and covered with light timber; on its southern and eastern sides are low brown cliffs. A small rocky islet covered with bushes, about 20 feet ($6^{m}1$) high, lies about a quarter of a cable eastward of Silagui islet. A coral patch, which dries, lies a quarter of a mile north-eastward of the rocky islet. The reef on which Silagui islet lies extends 1¼ cables eastward and about 6 cables northward from it.

Good anchorage may be obtained by small vessels with local know-

Chart 3811.

ledge, in a pocket in the reef about three-quarters of a mile north-north-westward of Silagui islet, in a depth of about 8 fathoms ($14^{m}6$), mud.

Off-lying dangers.—Buoy.—Arayat shoal, with a least depth of 16 feet ($4^{m}9$) over it, lies 6 miles southward of Taguisian point, and a 25-foot ($7^{m}6$) patch lies about 3 cables farther southward.

A black can buoy is moored about 3½ cables south-eastward of Arayat shoal.

In the area bounded by lines joining Lutangan island, Taguisian point, and Arayat shoal, there are several detached shoals, with depths of from 10 to 36 feet ($3^{m}0$ to $11^{m}0$) over them, the positions of which may be seen on the chart. When directly over them the bottom can be distinctly seen and they may be easily discerned from a distance by the discoloured water.

A 6-fathom ($11^{m}0$) patch lies about 3 miles eastward of Arayat shoal, and Liscum bank, with a depth of 7½ fathoms ($13^{m}7$) over it, lies about 4½ miles farther eastward. For the shoals farther northward, *see* page 262.

Charts 3463, 3811.

Port Sibulan.—Port Sibulan includes the central and largest part of the space between the southern side of Mindanao and Olutanga island. It is about 6 miles wide at the entrance between Taguisian point and Lapat point northward of it. From the head of the port Tantanang bay extends northward, and Tumalung bay indents the coast of Olutanga island southward; there are also several smaller bays indenting the shores.

The best depths in Port Sibulan between the entrance and the mouths of Tantanang and Tumalung bays are in the south-western part of the port, where the shore may be approached to a distance of one mile at any place, and even closer in some parts.

Chart 3463.

Outer part of Port Sibulan.—Dangers.—Beacons.—Buoy.—Taguisian point is a long narrow neck of land, densely wooded; narrow belts of mangrove fringe its north-eastern and south-western sides. At the south-eastern extremity of the point there are cliffs, about 40 feet ($12^{m}2$) high, and a white sandy beach. The cliffs do not show up well from offshore, being largely covered with overhanging bushes, but the large trees which cover the point grow up to the edge of the cliffs and present a definite and abrupt profile when seen from north-eastward or south-westward. A coral reef, which dries, extends about 3½ cables south-eastward and southward from the point.

Coayan (Koayan) bay, entered between Comot (Komot) point (*Lat. 7° 24′ N., Long. 122° 57′ E.*), situated about 2 miles north-westward of Taguisian point, and Cambulong (Kambulong) point, about one mile farther, has not been thoroughly examined; the head of the bay is shallow. The entrance points are low and densely wooded, and fringed with mangroves. Close south-eastward of Cambulong point is an islet, 30 feet ($9^{m}1$) high. A spit, with a depth of 2½ fathoms ($4^{m}6$) over its outer end, extends about three-quarters of a mile eastward from this point, and is marked on its northern side near the outer end by a pile beacon, surmounted by a white triangle, 14 feet ($4^{m}3$) high. A rock, 15 feet ($4^{m}6$) high, lies close off the southern entrance point of Coayan bay.

Charts 2576, 943, 1263.

Chart 3463.

Middle reef, with a least depth of 1½ fathoms (2^m7) over it, lies in the middle of the entrance to Port Sibulan. A bank, with depths of from 3 to 4¾ fathoms (5^m5 to 8^m7) over it, coral and sand, lies within 2 miles south-eastward of the shallowest spot.

A red conical buoy is moored on the south-western edge of the bank which extends south-eastward from Middle reef, and about 1¼ miles east-north-eastward of Comot point.

A pile beacon, 14 feet (4^m3) high, surmounted by a white triangle, marks the south-western edge of Middle reef, in a position about 1½ miles north-eastward of Cambulong point.

Lapat point is low, densely wooded, and fringed with a narrow belt of mangroves. Cliffs, about 20 feet (6^m1) high, border a small part of the southern extremity. Reefs, which dry, extend about half a mile from the southern and eastern sides of the point, and banks, with depths of less than 3 fathoms (5^m5) over them, extend about a quarter of a mile and one mile, respectively, outside the edge of the reefs. For dangers eastward of Lapat point, *see* page 262.

Letayen island, on which there is a prominent tree, visible at a distance of 20 miles, lies about 1¼ miles westward of Lapat point; the southern half of the island is densely wooded and the northern half is covered with coconut trees. It is fringed by a reef which extends about 1½ miles south-eastward, with a depth of 2 fathoms (3^m7) over it at its outer end. In the channel between the southern extremity of this reef and Middle reef there is a shoal, with a depth of 4¾ fathoms (8^m7) over it.

Balangan bay, entered between Lapat point and Tegolting point, 2 miles north-westward, affords anchorage sheltered from all winds, except those between south and south-east. The head of the bay, for a distance of about three-quarters of a mile, is shallow. The approach is between the reefs extending from Lapat point and Letayen island; it has a least depth of 10 fathoms (18^m3) in the fairway and is free from danger. There is also a narrow channel from westward between the north-western point of Letayen island and the reef which extends from Tegolting point.

Tegolting point is densely wooded and rises to an elevation of 126 feet (38^m4) about three-quarters of a mile north-westward of its southern extremity. The western and south-western sides consist of low cliffs with a sandy beach, and the eastern side is fringed with mangroves, at the southern end of which there is a prominent reddish-brown cliff, about 40 feet (12^m2) high. Tobac (Tobak) village is situated about a quarter of a mile north-westward of this cliff. A bank, with depths of less than 3 fathoms (5^m5) over it, extends about 6 cables south-eastward and southward from Tegolting point (*Lat. 7° 29′ N., Long. 122° 57′ E.*).

A 3-fathom (5^m5) patch lies about one mile south-westward of the western point of Letayen island, and a shoal, with a least depth of 3½ fathoms (6^m4) over it, lies about one mile west-south-westward of the same point. A 2½-fathom (4^m6) patch lies about three-quarters of a mile westward of the northern point of Letayen island. Between Letayen island and the reef extending south-eastward from it on the north-east, and the south-western shore of Port Sibulan on the south-west, there are several shoals, with depths of 5 and 5½ fathoms (9^m1 and 10^m1) over them, the positions of which may best be seen on the chart.

Charts 943, 1263.

Chart 3811.

Sibulan island, 65 feet (19^m8) high, and densely wooded, lies on the reef extending from the north-eastern side of Olutanga island, and 5 miles north-westward of Taguisian point. It has steep rocky sides, and on its eastern side there are some prominent yellow cliffs. A spit, with a depth of 13 feet (4^m0) over its outer end, extends half a mile north-westward from the island.

Sibulan river flows out about 3 cables south-westward of Sibulan island; there is a sandy beach on the eastern side of the mouth, and there are rugged cliffs on the western side.

Chart 3463.

Sibulan reef, with a depth of 2¾ fathoms (5^m0) over it, lies 9 cables northward of Sibulan island. It is marked on its south-western side by a pile beacon, about 12 feet (3^m7) high, surmounted by a diamond shaped daymark.

Chart 3811.

Inner part of Port Sibulan. — Dangers. — Buoy. — Sumangul point, 54 feet (16^m5) high, and wooded, lies about 1¾ miles west-north-westward of Sibulan island. It terminates in a narrow neck of land, half a cable wide, and is separated from the land southward of it by a depression which is very noticeable from eastward. The point can be readily identified from the entrance; it is covered with coconut trees for a distance of half a mile southward. The village of Sumangul stands on the point, and Calida village about half a mile south-eastward.

Taledom rock, 31 feet (9^m4) high, with bushes on its summit, lies 4½ cables north-eastward of Sumangul point; it shows up well except from northward. A sand spit, which dries, lies close northward of the rock. A bank, with a depth of 3 fathoms (5^m5) over its outer end, extends about 4 cables northward, and with a depth of one fathom (1^m8) over it, extends 3½ cables south-eastward from the rock.

A 2-fathom (3^m7) patch lies about three-quarters of a mile eastward of Sumangul point, and is marked on its western side by a red conical buoy.

Between Tegolting point and Kaladis point, about 2¼ miles north-westward, the coast consists of low cliffs, mangroves, and sandy beach. It is fringed by a reef which extends 3 cables offshore in places. Pandan village (*Lat. 7° 29′ N., Long. 122° 57′ E.*) stands on this shore, one mile north-westward of Tegolting point. Kaladis point is a red cliff, about 15 feet (4^m6) high.

Pandan reef, the northern end of which lies about one mile southward of Kaladis point, is an extensive coral reef with a ridge of white sand, which dries about 3 feet (0^m9), at the northern end; a spit, with a depth of 16 feet (4^m9) over it at its extremity, extends 8½ cables southward from the drying part of the reef. Pandan reef is separated from the reef which extends from the eastern shore by a channel with a least width of 4 cables, and with a least depth of 22 feet (6^m7) in the fairway.

About 2 miles north-westward of Sumangul point is Marek point, on the eastern side of which is a reddish-brown bank, 65 feet (19^m8) high; part of this bank is bare, and is prominent from the entrance to the port. The western side of the point is fringed with mangroves, and on the southern side is a sandy beach and low, perforated rocky cliffs. The settlement of Mudug is situated close southward of the bank.

Charts 943, 1263.

Chart 3811.

Saong bay is entered between Marek point and Tantanang point, about 2½ miles northward. Mangroves and coral fringe the shores, extending about half a mile from the southern side of the entrance. A 9-foot (2^{m}7) patch lies on the southern side of the entrance, about one mile southward of Tantanang point. Panagan river flows into the head of the bay, and there is a sandy beach northward of the mouth of the river which may be seen from the entrance to the bay.

Tantanang bay.—Tantanang bay, entered between Kaladis and Tantanang points, shoals gradually towards its head, and affords good sheltered anchorage to vessels with local knowledge in any desired depth. Between Tantanang point and the north-eastern corner of the bay the entire shore, except at one place, is fringed with mangroves, thence to Kaladis point, the points are densely wooded, and composed of low reddish-brown cliffs, and the indentations are fringed with a narrow belt of mangroves.

Tantanang point is densely wooded, and terminates in cliffs, about 15 feet (4^{m}6) high. A group of rocks, which dry about 3 feet (0^{m}9), lie on the fringing reef about one cable east-south-eastward of the point. About three-quarters of a mile northward of the point there is a cliff, about 10 feet (3^{m}0) high, showing clear of the mangroves. Some rocks, which dry 6 feet (1^{m}8), lie about 1¾ cables eastward of this cliff.

About three-quarters of a mile northward of Kaladis point is Chinkang or Naganaka, the site of a sawmill and wharf. The wharf with a **T**-head, 390 feet (118^{m}9) long, has a least depth of 19 feet (5^{m}8) alongside the face. Water may be obtained alongside.

Tumalung bay.—Tumalung bay is entered between Sumangul and Marek points. The depths in the bay are very irregular and there are numerous detached patches of coral and sand in the northern part. The southern half shoals gradually to within one mile of the head, where there are extensive mud flats, which dry. The entire shore is fringed with mangroves. At the entrance there is a least width of about three-quarters of a mile between the 3-fathom (5^{m}5) lines on either side, but inside the bay the channel is reduced to a width of about half a mile.

Close westward of Marek point (*Lat. 7° 28′ N., Long. 122° 52′ E.*), is a small bay, into which the Mudug river flows.

Lapinigan islands are two densely wooded islands lying on the western side of Tumalung bay and on the northern side of the eastern entrance to Canalizo strait. They are almost entirely fringed by mangroves, except on the north-eastern and eastern sides of the larger and eastern island, where there are cliffs about 30 feet (9^{m}1) high, and on the northern side of the other island, where there are cliffs 15 feet (4^{m}6) high. A bank, with depths of less than one fathom (1^{m}8) over it, extends 6½ cables south-eastward from the eastern island.

Charts 3463, 3811.

Anchorages.—Directions.—Good anchorage may be obtained in Balangan bay, in a depth of 8 fathoms (14^{m}6) mud, about half a mile north-eastward of Letayen island.

Good anchorage may be obtained by vessels with local knowledge, in depths of from 5 to 10 fathoms (9^{m}1 to 18^{m}3), in Tumalung bay, south-westward of Sumangul point.

A vessel entering Port Sibulan should round Taguisan point at a

Charts 943, 1263.

Charts 3463, 3811.

distance of not less than one mile and then steer for a position about midway between the beacon on Middle reef and the one off Cambulong point, passing about 2½ cables south-westward of the red conical buoy south-eastward of Middle reef; thence she should steer to pass about 2½ cables south-westward of Sibulan reef, and then 347° until the pier at Chinkang bears 025°, when she should steer for it on that bearing.

If proceeding to the anchorage in Tumalung bay the vessel should continue on her course when she is abeam of the beacon on Sibulan reef until Taledom rock bears 180°, when she should steer 222° until Sumangul point bears 090°, and then steer 184°, which leads to the anchorage, proceeding with caution as the water is always muddy and the dangers cannot be seen.

Chart 3463.

DUMANQUILAS BAY.—Dumanquilas (Dumankilas) bay, about 11 miles wide at its entrance between Lapat point and Dumanquilas (Dumankilas) point, eastward of it, affords good shelter and holding ground among the islands and in the bays that it encloses.

Chart 3811.

Dangers in the approach and in the entrance.—Arayat shoal and Liscum bank, the outermost dangers in the southern approach to Dumanquilas bay, have been described on page 258.

A 21-foot (6^{m}4) patch lies 5¾ miles east-south-eastward of Taguisian point.

Chart 3463.

Breeches shoal, with a least depth of 4¼ fathoms (7^{m}8) over it, is an extensive rocky, coral shoal, about 7¼ miles south-south-westward of Dumanquilas point. A 2-fathom (3^{m}7) patch lies 6¼ miles south-westward of the same point, and between this patch and the point are several shoals, with depths of from 3½ to 6¾ fathoms (6^{m}4 to 12^{m}3) over them, the positions of which may best be seen on the chart.

A shoal, with a least depth of 1¼ fathoms (2^{m}3) over it, lies about 5½ miles west-south-westward of Dumanquilas point (*Lat. 7° 28′ N., Long. 123° 10′ E.*). Acha rock, steep-to, with a least depth of 2 fathoms (3^{m}7) over it, coral and sand, lies about midway between Lapat and Dumanquilas points, and a shoal, with a least depth of 2¼ fathoms (4^{m}1) over it, lies about 1½ miles westward of the rock.

The bottom in the vicinity of Lapat point is rocky and irregular, with spits, over which there are depths of from 4 feet to 2¾ fathoms (1^{m}2 to 5^{m}0), extending about 1¾ miles eastward from the point. A 3¼-fathom (5^{m}9) patch lies about 2½ miles east-south-eastward of the point, and several shoals, with depths of from 1¾ to 5¾ fathoms (3^{m}2 to 10^{m}5) over them, lie within 4½ miles north-eastward of the point.

These shoals are generally small and steep-to, several of them having live coral rocks on them. They are difficult to distinguish at times owing to the silt carried down by the rivers during heavy rains, and great caution should be exercised in their vicinity.

Tidal streams.—The tidal streams in the open channels entering the bay seldom exceed one knot, but they are considerably stronger near the shoals in the approaches, and form eddies in their vicinity. They may be avoided by giving the shoals a berth of about one mile.

Outer part of Dumanquilas bay.—Dangers.—Dumanquilas

Charts 943, 1263.

Chart 3463.

point, the southern extremity of a high, bold peninsula, is fringed on the western side by a narrow reef, which, in the bay about 1¾ miles northward, extends about 4 cables offshore. Mount Botetian, 735 feet ($224^{m}0$) high, is the summit of this peninsula, and being practically detached from the high land northward of it, is very prominent.

The coast between Dumanquilas point and Carabuca (Karabuka) point, 7 miles north-westward, consists of low hills covered with high trees. Between Dumanquilas point and Labucan (Labukan) point, about 4½ miles north-westward, there is a bay which is foul at its head.

Triton island, 155 feet ($47^{m}2$) high, wooded and rocky, lies about 2½ miles north-westward of Dumanquilas point and about three-quarters of a mile offshore. It is steep on the southern side, but slopes on the northern side. It is fringed by a reef on the northern and western sides, and a spit, with depths of from 1¼ to 2¾ fathoms ($2^{m}3$ to $5^{m}0$) over it, extends 3 cables north-north-eastward from the island. A 2-fathom ($3^{m}7$) patch lies 4 cables northward, and a 2¾-fathom ($5^{m}0$) patch lies 2½ cables north-north-westward of the island. A shoal, with a depth of 5¼ fathoms ($9^{m}6$) over it, lies 4¼ cables north-westward of the island.

Labucan point, Buca (Buka) point, about 1¾ miles north-north-westward, and Carabuca point may be passed at a distance of half a mile. There is, however, a 5-fathom ($9^{m}1$) patch lying about one mile north-westward of Labucan point and about three-quarters of a mile offshore. A 4¼-fathom ($7^{m}8$) patch lies a quarter of a mile westward of Buca point, and a spit, with depths of less than 6 fathoms ($11^{m}0$) over it, extends about 4 cables westward from the point situated about 3½ cables northward of Buca point.

A shoal, with a depth of 2¾ fathoms ($5^{m}0$) over its northern end, and 4¾ fathoms ($8^{m}7$) over its southern end, lies about 1½ miles westward of Carabuca point.

On the western side of Dumanquilas bay there is a 2¼-fathom ($4^{m}1$) patch lying 6½ cables offshore, and three-quarters of a mile southward of Lapiran point, situated 5¼ miles north-north-eastward of Lapat point. A 7-fathom ($12^{m}8$) patch lies about 2¼ miles eastward of Lapiran point.

Between Carabuca point (*Lat. 7° 34′ N., Long. 123° 06′ E.*) and Igat point, the western extremity of Igat island, and about 2¾ miles northward, there is a bay, near the middle of which there is a shoal, with a patch of white sand, which dries one foot ($0^{m}3$), on the north-eastern edge.

Igat island, 705 feet ($214^{m}9$) high, and wooded, is separated from the mainland by a narrow channel which dries, but is navigable at high water by small boats. Igat point is steep-to at a short distance off it.

Tigabon, Lamuyong, and Lambang Lambang islands lie on the western side of Dumanquilas bay, from about three-quarters of a mile to one mile offshore. They are covered with large trees or coconut palms. A spit, with depths of less than 3 fathoms ($5^{m}5$) over it, extends about 2 cables southward from Tigabon island, and spits, with depths of less than 5 fathoms ($9^{m}1$) over them, extend 1½ cables south-eastward from Lamuyong island, and Lambang Lambang island. Two shoals, with depths of 3¾ and 3¼ fathoms ($6^{m}9$ and $5^{m}9$) over them, lie 4½ cables west-south-westward and 5 cables westward, respectively, of the

Charts 3811, 943, 1263.

Chart 3463.

southern extremity of Tigabon island. Between these islands and the mainland westward are Malibak and Bacolog (Bakolog) islets, lying on the coastal reef. Bugsok rock, awash, lies 2 cables westward of Lambang Lambang island.

Tangcocoloan (Tangkokoloan) rocks, 3 feet ($0^{m}9$) high and steep-to, lie about one mile eastward of Lamuyong island.

A 4¼-fathom ($7^{m}8$) patch lies 8 cables northward of Lambang Lambang island, and about the same distance offshore.

About 2 miles northward of Lambang Lambang island is Igai point, the north-eastern entrance point of a bight which extends north-westward. Fresh provisions may be obtained from the village of Malangai, on the northern side of the bight. The village of Malangas is situated on the western side of the bight.

Nipa Nipa islands (*Lat. 7° 37′ N., Long. 123° 05′ E.*) are three densely wooded islands lying about midway between Igat and Igai points, with a channel leading into the inner part of Dumanquilas bay on either side; the largest island is 239 feet ($72^{m}8$) high.

Inner part of Dumanquilas bay.—Dangers.—A spit, on which there is a depth of about one foot ($0^{m}3$) over it, near the outer end, extends 4½ cables eastward from Igai point, and another spit, with a similar depth over it, extends about half a mile eastward from the shore about three-quarters of a mile northward of the point. Puli Puli islet lies 3½ cables north-eastward of Igai point.

In the middle of the channel between Igai point and the Nipa Nipa islands there is a coral patch, with a depth of 3 feet ($0^{m}9$) over it, and about a quarter of a mile north-westward of it there is a 4¾-fathom ($8^{m}7$) patch. In the channel between Igat point and the Nipa Nipa islands there is a least depth of 9 fathoms ($16^{m}5$).

A shoal, with a least depth of 1¼ fathoms ($2^{m}3$) over it, lies about 1½ miles east-north-eastward of Igai point.

Lapinigan island, 74 feet ($22^{m}6$) high, and wooded, lies about 2½ miles northward of the largest of the Nipa Nipa islands. A rock, with a depth of about 4 feet ($1^{m}2$) over it, and steep-to, lies 6½ cables southward of Lapinigan island.

Putili islet (*Lat. 7° 38′ N., Long. 123° 07′ E.*), 78 feet ($23^{m}8$) high to the tops of the trees and steep-to, lies about 2¼ miles north-north-eastward of Igat point. A shoal, with a least depth of 2 feet ($0^{m}6$) over it, lies about three-quarters of a mile south-eastward of Putili islet, and a 6-fathom ($11^{m}0$) patch lies about 1½ miles farther south-eastward. A 5¾-fathom ($10^{m}5$) patch lies half a mile north-eastward of the islet.

Latas islet, 94 feet ($28^{m}7$) high, lies close to the eastern shore, 2 miles northward of Putili islet. It is infested by numerous large brown bats.

Cabog (Kabog) islands are two islands, the northern and higher of which is 310 feet ($94^{m}5$) high, lying about 2¼ miles northward of Putili islet; they are covered with coconut trees. A spit, with a depth of about one foot at its outer end, extends about 1½ cables from the southern side of the southern island. There is a least depth of 2 fathoms ($3^{m}7$) in the channel between the two islands which is about three-quarters of a cable wide. Northward of the islands the depths decrease gradually from 3¾ fathoms ($6^{m}9$) to the extensive mud banks, which dry, about one mile north-eastward, which extend from the mouths of the Kumalarang and Bualan rivers, which flow into the head of Dumanquilas bay.

Charts 3811, 943, 1263.

Kumalarang river, the western of the two, is navigable by small craft with local knowledge for about 3 miles from the entrance. There are two entrance channels, the better one lying on the eastern side of the head of the bay; the western channel follows close along the western shore of the bay. Bualan river is navigable by small craft for about one mile from the entrance. The entrance channel follows close along the eastern shore of the bay.

Igat bay.—Igat bay is the large inlet on the eastern side of Dumanquilas bay, and lies with its entrance between Igat point and Latas islet. It is a safe and commodious harbour, and is one of the best anchorages in Mindanao.

A spit, with depths of less than 3 fathoms (5^{m}5) over it, extends 1¾ cables southward from Dayana point, on the north-eastern side of Igat bay, about 1¾ miles south-south-eastward of Latas islet. About 2¼ miles eastward of Dayana point is the entrance to Labao inlet, which is navigable at high water by launches for nearly half a mile as far as Song Lupa. Gapul creek, which flows out about one mile southward of the entrance to Labao inlet, is navigable at high water by launches for about one mile. Lapuyan river, which flows out close southward of Gapul creek, can be entered only at high water, when small boats can ascend 1¾ miles.

A bank, with a reef, which dries at its outer edge, extends about 6 cables south-westward from Batu Manoyak point (*Lat. 7° 38′ N., Long. 123° 10′ E.*), situated 2¼ miles south-eastward of Dayana point, and from the shore south-eastward of it.

Margosatubig, on the southern shore of Igat bay, is a settlement with a post office and a hospital. There are two piers, the larger of which has a length along its outer face of 180 feet (54^{m}9), and had, in 1937, a least depth of 20 feet (6^{m}1) alongside. The other pier had a least depth of 10 feet (3^{m}0) alongside. Fresh water may be obtained alongside the smaller pier.

A 4¼-fathom (7^{m}8) patch lies about 2 cables north-north-westward of the point situated about half a mile north-westward of Margosatubig.

Anchorages.—Directions.—Anchorage may be obtained at the head of the bight on the western side of Dumanquilas bay, off Malangai, in depths of from 6 to 8 fathoms (11^{m}0 to 14^{m}6), mud.

Anchorage may be obtained off Margosatubig, in depths of from 12 to 14 fathoms (21^{m}9 to 25^{m}6), mud, about half a mile offshore, westward of the piers, or closer in according to draught.

A vessel should approach the entrance to Dumanquilas bay with Mount Botetian, bearing between 000° and 320°. If bound for the pier at Malangai, she should give Dumanquilas point and Triton island a berth of about one mile, and steer for Tigabon island, bearing 325°, passing a quarter of a mile eastward of Tigabon, Lamuyong, and Lambang Lambang islands, and continuing northward until the pier-head at Malangai bears 305°, when she should steer for it on that bearing.

If proceeding to the anchorage southward of Malangai, the vessel should pass about half a cable southward of the head of the pier and steer 270° to the anchorage.

If bound for Margosatubig, after passing Triton island, she should steer to pass one mile westward of Buca point, thence about midway between Igat point and the Nipa Nipa islands, thence give the northern

Chart 3463.

side of Igat island a berth of about half a mile, and anchor according to draught off Margosatubig, westward of the piers.

Charts 3463, 3811.

COAST.—Maligay bay.—Dangers.—Maligay bay is entered between Dumanquilas point and a point on the western side of the Baganian peninsula, about 6 miles eastward. The western and northern sides of the bay consist of a series of rocky points interspersed with mangrove. Coral reefs, which dry, extend from one cable to three-quarters of a mile from these shores. The eastern shore is mostly bordered with mangrove and fringed with coral reefs, which dry, extending from a quarter of a mile to one mile offshore. An extensive series of shoals, with depths of from 1¾ to 6 fathoms ($3^{m}2$ to $11^{m}0$), over them, white sand and coral, extend about 3½ miles westward from the eastern shore, with deep, narrow channels between them. The positions of these shoals may best be seen on the chart.

Maculay (Makulay) island, 293 feet ($89^{m}3$) high, wooded, and rocky, lies on the shore reef in the north-western part of the bay. A 3-fathom ($5^{m}5$) patch lies about 4 cables south-westward of the southern extremity of the island, and a rock, with a depth of 5¾ fathoms ($10^{m}5$) over it, lies one mile north-eastward of the same point, and 3 cables from the northern shore of the bay.

Lunqui island, 284 feet ($86^{m}6$) high, wooded, and rocky, lies on the shore reef in the northern part of the bay, about 1¾ miles east-north-eastward of Maculay island. A coral reef extends 1½ cables from the eastern side of the island.

Anchorages.—Anchorage may be obtained, in depths of from 5 to 15 fathoms ($9^{m}1$ to $27^{m}4$), in an area about half a mile wide, close northward of the westernmost bank in the entrance to Maligay bay, and vessels with local knowledge may anchor in the bight in the north-eastern corner of the bay, in depths of from 10 to 13 fathoms ($18^{m}3$ to $23^{m}8$), mud, but the entrance between the reefs extending from either side is only about a quarter of a mile wide.

Good anchorage may be obtained over a small sandy area, in a depth of from 14 to 16 fathoms ($25^{m}6$ to $29^{m}3$), about 3 cables north-eastward of Maculay island (*Lat. 7° 31′ N., Long. 123° 13′ E.*), with the eastern extremity of the island bearing 185° and the northern extremity 255°, or farther north-eastward, in depths of from 20 to 25 fathoms ($36^{m}6$ to $45^{m}7$), mud. These are the only sheltered anchorages during the South-west monsoon for deep draught vessels.

Small craft with local knowledge may obtain a protected anchorage, in depths of from 5 to 10 fathoms ($9^{m}1$ to $18^{m}3$), northward of Lunqui island about three-quarters of a cable from the northern side of the island.

Chart 3811.

Baganian peninsula.—The Baganian peninsula, situated between Maligay and Illana bays, is traversed throughout its length by a mountain range, the summit of which is Mount Flecha, 1,126 feet ($343^{m}2$) high, wooded and flat-topped, lying 4¼ miles northward of Flecha point, the southern extremity of the peninsula. The northern end of the peninsula between Maligay bay and Port Sambulauan is low and about 2½ miles wide.

Between the entrance to Maligay bay and a small bay about 2½ miles

Charts 943, 1263.

Chart 3811.

north-westward of Flecha point, the coast is fringed with mangroves, thence to Flecha point, it consists of a rocky ledge, about 15 feet ($4^{m}6$) high, interspersed with stretches of sand. The whole of this coast is fringed by a steep-to, coral reef, which dries, which extends from about half a mile offshore at the entrance to Maligay bay to one cable at Flecha point. Flecha point, which is densely wooded, terminates in a rocky ledge, about 15 feet ($4^{m}6$) high, and from it the land rises gradually to Mount Flecha.

Baganian river flows out through the mangroves at the head of the bight about midway between Flecha point and Tambulian point, about 3 miles east-north-eastward. At the mouth of the river is a pier with a **T**-head, the face of which is 145 feet ($44^{m}2$) in length, with depths, in 1937, of from 13 to 35 feet ($4^{m}0$ to $10^{m}7$) alongside. Water may be obtained alongside it.

A coral shoal, with a depth of 9 feet ($2^{m}7$) over it, lies about three-quarters of a cable south-south-eastward of the head of the pier.

Anchorages.—Anchorage may be obtained, in a depth of about 20 fathoms ($36^{m}6$), south-westward of Mount Flecha, also over the sandy flat which extends nearly one mile off Flecha point, in depths of from 10 to 20 fathoms ($18^{m}3$ to $36^{m}6$), but during strong winds a heavy sea sets round the point. When rounding the point vessels should give it a berth of at least half a mile to avoid the 4-fathom ($7^{m}3$) patch south-eastward of it.

Anchorage may be obtained by vessels with local knowledge, in depths of from 21 to 23 fathoms ($38^{m}4$ to $42^{m}1$), coral sand, about 2¾ cables south-eastward of the pier-head at the mouth of Baganian river.

Off-lying island.—Paniquian (Panikian) island, about 4½ miles westward of Flecha point, is a sandy wooded island, about 4 feet ($1^{m}2$) high. It is fringed by a reef, which partly dries, and from the southern side extends about 3½ cables; from the edge of the reef on this side a sand spit extends three-quarters of a mile farther southward. Outside depths of 10 fathoms ($18^{m}3$) round the island the depths increase very rapidly. A prominent wooded islet, 9 feet ($2^{m}7$) high, lies on the fringing reef about 2 cables south-eastward of the island.

An exposed anchorage may be obtained by vessels with local knowledge, in depths of from 5 to 8 fathoms ($9^{m}1$ to $14^{m}6$), over the spit extending from the southern side of Paniquian island (*Lat. 7° 22′ N., Long. 123° 20′ E.*). The bottom is usually plainly visible at a depth of 10 fathoms ($18^{m}3$).

ILLANA BAY.—Illana bay is entered between Tambulian point and Tapian point, 39 miles east-south-eastward.

Tidal streams.—In the vicinity of Flecha point and in Illana bay the tidal streams run at a considerable rate, especially the east-going stream, and cause a heavy sea when there is any wind. Vessels bound to anchorages on the eastern side of the bay from Basilan strait frequently find on nearing that side that they have been set appreciably southward. Great care should be exercised when coasting off the southern end of the Baganian peninsula.

Western side of Illana bay.—Coast.—The eastern side of the Baganian peninsula rises gradually to Mount Flecha, and is densely wooded and sparsely inhabited. It is fringed by a coral reef, which

Charts 943, 1263.

dries, which, from Limbug cove (*see* below), gradually widens until Gasacan (Gasakan) point, about 3¾ miles northward of the cove, is reached, where it extends over one mile offshore. There are no large rivers along this part of the coast, the Bubuday, which flows out about one mile southward of Gasacan point, being the largest. There are no off-lying dangers in this vicinity, except Rios rock (*see* below), and the eastern side of the Baganian peninsula may be safely navigated at a distance of one mile as far northward as the mouth of Bubuday river.

Tambatan point, about 3½ miles northward of Tambulian point, is low, and inconspicuous, except from a northerly or southerly direction.

Limbug cove is entered 3¼ miles north-westward of Tambatan point. It is fringed by reefs, which, at the entrance, narrow the navigable channel to a width of about one cable between the 3-fathom ($5^{m}5$) lines on either side. About 6 cables south-eastward of the eastern entrance point there is a bare bluff, which shows white in the sunlight, and is a good mark for identifying the entrance. Anchorage may be obtained by small vessels with local knowledge in the cove, in a depth of about 10 fathoms ($18^{m}3$). There is a 22-foot ($6^{m}7$) patch near the middle of the cove, and about half a mile from the head.

Off-lying danger.—Rios rock, with a least depth of one fathom ($1^{m}8$) over it, lies about 4¾ miles northward of Tambatan point, and about 4 miles offshore.

Port Sambulauan.—Port Sambulauan, entered between Gasacan point, situated 7½ miles north-westward of Tambatan point, and Pisan point, about 1¾ miles northward of Gasacan point, is of little importance, being merely a narrow tortuous break in the reefs. The navigable channel at the entrance is about 3¾ cables wide between the reefs which extend from either side, and inside, this is reduced to about 1½ cables by reefs and detached rocks which dry. The water is generally muddy which renders the dangers difficult to distinguish. The tidal streams follow the channel, producing strong currents and eddies at the entrance.

Gasacan point (*Lat. 7° 32′ N., Long. 123° 23′ E.*) is low and fringed by reefs which extend about one mile eastward. Southward and south-westward of the point and within a distance of three-quarters of a mile of it are the Bacayauan hills, which are prominent. The north-eastern hill is 405 feet ($123^{m}4$) high, and well wooded; the south-western hill is 360 feet ($109^{m}7$) high, and covered with grass.

Pisan island, which forms the north-eastern side of Port Sambulauan, is low and consists mainly of mangroves; it is separated from the coast of Mindanao by the Dinas and Panaldan rivers, on the western and northern sides, respectively. Pisan point, the southern extremity of the island, consists of mangroves and is fringed by reefs which dry, which extend 2½ miles eastward and 1½ miles south-eastward.

Sambulauan hill, 300 feet ($91^{m}4$) high, lies at the head of the port, about 3 miles north-westward of Pisan point. It is considerably lower than the mountains farther inland, which attain elevations of from 1,400 to 2,000 feet ($426^{m}7$ to $609^{m}6$), but on account of it being covered with tall grass, it stands out prominently, especially on a clear day.

The town of Dinas, situated about 2 miles northward of the head of Port Sambulauan, on the Dinas river, is not visible from seaward.

A contracted anchorage may be obtained by small vessels with

Chart 3811.

local knowledge near the head of the port, in depths of from 4 to 5 fathoms ($7^{m}3$ to $9^{m}1$), mud.

Coast.—Malubug bay, entered between Pisan point and Malubug point, 6½ miles north-eastward, is encumbered with reefs, the greater part of which are awash, leaving narrow channels between them. The entire shore line is composed of mangroves, from which the land rises gradually to the mountains inland. Panaldan and Tuludan rivers flow into the south-western and north-western corners, respectively, of Malubug bay; their delta is a network of small streams through the mangroves. Two small villages, Kalipapa and Dansalan, are situated on the northern shore of the bay.

Sagayaran island, 375 feet ($114^{m}3$) high, wooded, and fringed by reefs, which partly dry, lies about one mile southward of Malubug point. Between the island and the point are the Ticala islets, wooded and three in number. The two southern islets lie on the same reef as Sagayaran island and northward of it; the western of these two is 185 feet ($56^{m}4$) high; the northern islet lies on the coastal reef extending southward from Malubug point, and is 120 feet ($36^{m}6$) high.

A shoal, with a depth of 27 feet ($8^{m}2$) over it, and steep-to, lies about three-quarters of a mile eastward of the south-eastern Ticala islet. Between the edge of the reef extending eastward from Pisan point and Sagayaran island there are several sunken dangers, the positions of which may be seen on the chart.

Good protected anchorage may be obtained by vessels with local knowledge, in a depth of 16 fathoms ($29^{m}3$), mud, about a quarter of a mile westward of the western extremity of Sagayaran island. This is the best anchorage in the vicinity.

Between Malubug point (*Lat. 7° 38′ N., Long. 123° 28′ E.*) and Tagalo point, about 5½ miles northward, and thence to Dupulisan point, about 3 miles farther north-westward, the coast is bold and indented by several small coves, encumbered by reefs, at the heads of which small streams flow out through the mangroves. There are several small villages on this coast. The land rises steeply to elevations of from about 1,300 to 1,650 feet ($396^{m}2$ to $502^{m}9$). Tagalo point is a bold headland, rising to an elevation of 800 feet ($243^{m}8$) about three-quarters of a mile inland; it is fringed by a narrow reef, and can be safely passed at a distance of half a mile.

Off-lying dangers.—About 1¾ miles east-north-eastward of Malubug point is a shoal with a least depth of 2 fathoms ($3^{m}7$) over it, and marked by discoloration; there is a channel about one mile wide between it and the coastal reef.

About 1½ miles eastward of Tucabadoc point, which is situated 2 miles northward of Malubug point, is a rocky patch, with a depth of 27 feet ($8^{m}2$) over it, and about half a mile north-eastward of this patch is another rocky patch, with a depth of 33 feet ($10^{m}1$) over it. The channel between these patches and the coastal reef is one mile wide, deep, and clear of dangers.

Tagalo reefs consist of two patches, each with a depth of 13 feet ($4^{m}0$) over it, with a deep channel between them, lying about 1¾ and 2¾ miles eastward of Tagalo point. The channel between the western reef and the point is deep and clear of danger.

Pagadian bay. — Dangers. — Pagadian bay, situated in the

Charts 943, 1263.

Chart 3811.

north-western part of Illana bay, is about 9 miles wide at its entrance between Tagalo point and Calibon (Kalibon) point. The land on the western side of the bay rises gradually towards the mountains inland. The northern shore between Calibon point and Suanbato point, 8½ miles westward, is low and fringed with mangroves.

Calibon point is fringed by a narrow, very steep-to coral reef; the land close northward of it rises steeply to an elevation of over 1,000 feet ($304^{m}8$), and is covered with tall grass and small trees. This ridge is the only mountain of this description on the northern shore of Illana bay, and is easily identified from Tambulian point by its green appearance.

Between Calibon point and a point 1½ miles westward of the mouth of the Tukuran river, situated about 1½ miles north-westward, the coast is steep-to, thence to Suanbato point, reefs extend about half a mile offshore. The valley between Calibon point and Suanbato point is drained by several rivers and is the richest and best cultivated tract of country on the shores of Illana bay. There are several villages situated on this shore. Tukuran, at the mouth of the river of the same name, consists of a few houses and some old barracks on the hill.

Suanbato point (*Lat. 7° 49′ N., Long. 123° 28′ E.*) is low and flat, covered with mangroves, and fringed by reefs which extend 6 cables southward, with a detached one-fathom ($1^{m}8$) patch about 3 cables farther southward. This point is not easily identified from southward, but shows up well from the eastward and westward. A shoal, with a depth of about one foot ($0^{m}3$) over it, lies about 2 miles eastward of Suanbato point and nearly one mile from the northern shore.

Boca reefs are a chain of reefs lying in the middle of the entrance to Pagadian bay, with the south-eastern end lying 2½ miles north-eastward of Tagalo point. A part of the reef dries about 5 feet ($1^{m}5$), parts are awash, and the remainder has depths of from one foot to 3 fathoms ($0^{m}3$ to $5^{m}5$) over it. There are several channels between these reefs and there is a channel between the north-western end and the northern shore, but the main channel to Dupulisan and Pagadian anchorages lies between the south-eastern end and Tagalo point.

Dupulisan point, about 40 feet ($12^{m}2$) high, stands out clear from the wooded land which rises to an elevation of 705 feet ($214^{m}9$) about three-quarters of a mile south-westward. It is fringed by a steep-to coral reef, which extends about 1½ cables offshore.

Dupulisan bay, north-westward of Dupulisan point, is nearly 1½ miles wide at its entrance. The shores of the bay are fringed with coral and a mud flat extends about 4 cables from the head. A reef, with a depth of 3 feet ($0^{m}9$) over it, lies about 5½ cables east-north-eastward of the north-western entrance point of the bay.

Anchorages.—Pagadian anchorage, situated in the north-western corner of Pagadian bay, is fringed with reefs, and in its northern part there are two detached reefs which dry. Dumagok islet, 190 feet ($57^{m}9$) high, and wooded, lies on the western side of the entrance to the anchorage and is connected to the shore westward of it by a reef. It may be safely passed on its eastern side at a distance of a quarter of a mile. Lampaqui islet, low, flat, and wooded, lies near the outer end of the reef extending about 3½ cables south-eastward from the north-western shore. Balangasan village is situated on the north-western side of the anchorage, and Pagadian village between the mouths of

Charts 943, 1263.

Chart 3811.

Pagadian and Talapacan rivers on the eastern side. There is a small stone mole at Pagadian village.

Good anchorage may be obtained by vessels with local knowledge midway between Dumagok and Lampaqui islets, in a depth of 13 fathoms ($23^{m}8$), mud, or in the same depth between Lampaqui islet and Pagadian village. In approaching the latter anchorage care should be taken to avoid the reef which dries lying within half a mile south-eastward of Lampaqui islet.

Good anchorage may be obtained by vessels with local knowledge in the middle of Dupulisan bay, in a depth of 15 fathoms ($27^{m}4$), mud.

Anchorage may be obtained by vessels with local knowledge off Tukuran village, in a depth of 20 fathoms ($36^{m}6$), mud, with the blockhouse near the beach bearing 355°, from 1½ to 2 cables offshore. This anchorage should be approached with caution, as the depths shoal suddenly. The sea in this vicinity is much discoloured at times by muddy water from Tukuran river.

Eastern side of Illana bay.—Coast.—Tapian point is low for a distance of half a mile from its extremity, sandy, and wooded; it is fringed by a reef which extends about 1½ cables offshore.

Tapian reef, with a depth of 15 feet ($4^{m}6$) over it, lies 8 cables north-westward of Tapian point, with a deep channel between them.

Between Tapian point (*Lat. 7° 09′ N., Long. 124° 04′ E.*) and Linek village, 5½ miles east-north-eastward, the coast is fringed by a narrow steep-to coral reef, awash. For a distance of from a quarter of a mile to one mile within the coast the land is covered with bushes, coconut trees and grass, backed by a range of hills, from about 1,350 to 1,700 feet ($411^{m}5$ to $518^{m}2$) high, running in a direction approximately parallel with the coast. Between Linek and Bulusan point, about 1¼ miles north-north-eastward, the coast is low and generally fringed with mangroves; a steep-to reef extends about half a mile offshore and several streams flow out on this stretch of coast.

Mount Cabalata (Kabalata), an excellent landmark, lies about 3 miles southward of Bulusan point and about 1½ miles from the coast; it is sugar-loaf shaped and rises to an elevation of 2,325 feet ($708^{m}6$), and its slopes are covered with grass. About 3¼ miles southward of Mount Cabalata is a peak, on which there is a conspicuous tree.

Mindanao river.—Mindanao river, the largest river in Mindanao, flows out from about 6½ to 10½ miles east-north-eastward of Tapian point by the Cotabato (Kotabato) and southern entrances and several smaller mouths. The river which flows through a fertile valley, runs in a north-westerly direction for 45 miles and at 21 miles from its mouth divides into two arms which enter the sea about 4½ miles apart, and between them form a considerable delta. These arms are connected by several small channels. The northern arm is the wider and deeper and is navigable for small steamers.

The bar is reported to have a depth of 5 feet ($1^{m}5$) over it, and vessels with a draught of 9 feet ($2^{m}7$) can reach Cotabato (Kotabato), about 5 miles up from the Cotabato entrance, and small local craft with a draught of 7 feet ($2^{m}1$) can reach Peidu Pulangui, a village 27 miles up the river. The wharves at Cotabato will accommodate any vessels which can navigate the river.

Near the mouths of the river and occasionally in the offing are found numerous small floating islands composed of grass and floating débris

Charts 2575, 943, 1263.

of all kinds, and logs and trunks of trees of considerable size are frequently seen. The river currents are felt well offshore, and at times discoloured water extends to Bongo island and Polloc harbour. The bars at the entrances are subject to change during freshets.

The southern entrance to Mindanao river lies between Bulusan point and Gardoqui point, about 6 cables northward. A bank, which dries, extends about half a mile westward of a line joining the two points. The land in this vicinity is low and covered with coconut trees and bushes. This entrance is only used by native craft. Tamontaca (Tamontaka) village is situated about 5 miles up the river. There is a depth of only 3 feet ($0^{m}9$) on the bar.

About 1½ miles north-eastward of Gardoqui point and close to the coast, is Timaco hill, 603 feet ($183^{m}8$) high, densely wooded, and very prominent as it is surrounded by low land. Its western side is rocky and rugged, with cliffs, 50 feet ($15^{m}2$) high; several rocks lie off the northern and western sides of the hill. Between Timaco hill and the Cotabato entrance, a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends nearly one mile offshore.

The town of Cotabato is situated on the south bank of the northern arm of the river. There are two wharves, with depths of 14 and 4 feet ($4^{m}3$ and $1^{m}2$), alongside, respectively, in 1937, with a soft mud bottom, and a quay, about 725 feet ($221^{m}0$) long, on the south bank of the river, with depths, in 1937, of from 7 to 14 feet ($2^{m}1$ to $4^{m}3$) alongside. The tidal streams are strong off the wharves, and as the river here is narrow considerable difficulty is experienced in turning with an ebb stream. Cotabato hill (*Lat. 7° 15′ N., Long. 124° 12′ E.*), 185 feet ($56^{m}4$) high, and prominent, lies about half a mile southward of the wharves; on it is a prominent white building.

Anchorage.—Buoy.—The best anchorage for vessels desiring to communicate with Cotabato is about one mile offshore, in depths of from 5 to 20 fathoms ($9^{m}1$ to $36^{m}6$), mud, with Mount Cabalata, bearing 199°, open westward of Timaco hill, and the southern extremity of Bongo island, 277°. This anchorage lies close north-westward of a black can buoy which marks the edge of the 5-fathom ($9^{m}1$) line. Vessels should approach this anchorage with caution as the depths shoal very suddenly; it is not recommended for large vessels.

Directions.—A vessel bound for Cotabato should steer for the light-structure at the Cotabato entrance, bearing about 154°, and when nearly up to it she should alter course eastward and keep towards the southern shore until abeam of the low mangrove-covered islet about three-quarters of a mile eastward of the light-structure, thence she should steer 030°, which will lead across the bar in a depth of about 5 feet ($1^{m}5$). In 1939, the bar was reported to be shoaling gradually.

Coast.—Between Panalisan point, the northern entrance point of the Cotabato entrance, and Marigabato point, 5¼ miles northward, the coast is low, intersected by several small streams, and fringed by a reef which extends in some places nearly three-quarters of a mile offshore.

Bongo island.—Bongo island, in the western approach to Polloc harbour, is 340 feet ($103^{m}6$) high at the south-western end, and densely wooded throughout. It is fringed by reefs, which, on the north-eastern, northern and north-western sides extends half a mile offshore. On the north-western side of the island shoals, with depths of less than 3 fathoms ($5^{m}5$) over them, extend about 1½ miles beyond the edge of

Chart 3811.

the fringing reef; this side of the island should be given a wide berth. A 16-foot (4$^{\mathrm{m}}$9) patch lies about 2½ miles north-westward of Utara point, the north-eastern extremity of the island. There are several islets lying from a quarter of a cable to one cable from the south-eastern side of the island. The channel between the reef extending from Utara point and Tugapangan point (*see* below) is 4 miles wide and clear of dangers. Limbayan islet, 28 feet (8$^{\mathrm{m}}$5) high, and well defined from east or west, lies three-quarters of a cable southward of Salatan point, the southern extremity of Bongo island.

Bongo shoal, with a depth of 21 feet (6$^{\mathrm{m}}$4) over it, lies about 3 miles from the north-western side of Bongo island and 6 miles westward of Utara point (*Lat. 7° 23′ N., Long. 124° 05′ E.*). A 4-fathom (7$^{\mathrm{m}}$3) coral patch lies one mile westward of Bongo shoal. Both of these shoals are steep-to.

Chart 957, plan of Palak harbour.

Polloc harbour.—Dangers.—Polloc (Palak) harbour, entered between Marigabato point and Tugapangan point, about 4¼ miles north-westward, is an excellent well-sheltered harbour, easy of access, but with considerable depths. It is protected from westerly winds by Bongo island. On the southern side is Polloc anchorage, on the east, Parang anchorage, and on the north, Quidamak (Kidamak) and Sugut bays. The shore is fringed by a steep-to coral reef, narrow on the northern side, but extending from 2 to 3½ cables from the southern side and over one mile from the southern side of Sugut bay. The outermost danger, which is a 2-fathom (3$^{\mathrm{m}}$7) patch with 1¼-fathom (2$^{\mathrm{m}}$3) patches one and 3 cables eastward of it, lies about 1½ miles westward of Lalayanga point, situated on the northern side of Parang anchorage.

Marigabato point is steep-to except on the northern side, where a rocky ledge, which dries, extends about one cable offshore. Polloc island lies on the southern side of Polloc harbour, and is separated from the southern shore by a narrow channel called Sampinitan creek, in which there is a depth of less than 2 feet (0$^{\mathrm{m}}$6). The northern and eastern sides of the island are fringed with reefs and shoals extending about one and 3½ cables, respectively, offshore. A reef, which dries, also extends about a quarter of a mile offshore between the north-western side of Polloc island and Marigabato point.

The town of Polloc (Palak) is situated on the eastern side of Polloc island. A stone mole, in a bad state of repair, extends eastward from the northern part of the town.

Parang village is situated at the head of Polloc harbour. There is a concrete pier, with a depth, in 1938, alongside its southern face of 30 feet (9$^{\mathrm{m}}$1), and alongside the northern face from 17 to 6 feet (5$^{\mathrm{m}}$2 to 1$^{\mathrm{m}}$8). A shoal, with a least depth of 2 feet (0$^{\mathrm{m}}$6) over it, lies half a cable north-westward of the head of the pier.

There is a village on the north-western shore of Sugut bay. The southern side of the bay is encumbered with reefs.

Tugapangan point is 350 feet (106$^{\mathrm{m}}$7) high, rocky, with low bluffs, and covered with grass and trees; the point is steep-to and may be rounded at a distance of a quarter of a mile. A pinnacle rock lies close southward of the point.

Anchorages.—Anchorage may be obtained eastward of Polloc island, on a prolongation of the mole and about 3¾ cables from its head, in a depth of 17 fathoms (31$^{\mathrm{m}}$1), mud. Small vessels may anchor

Chart 957, plan of Palak harbour.

farther southward and westward, in a depth of not less than **14** fathoms (25^m^6), as the shoals on the southern side of the harbour are steep-to.

Good anchorage may be obtained by large vessels about a quarter of a mile from the head of the pier at Parang, in depths of from **14** to 15 fathoms (25^m^6 to 27^m^4). Anchorage may be obtained, in a depth of 8 fathoms (14^m^6), on the eastern side of Quidamak bay.

Tidal streams.—Tides.—The stream turns at high and low water at Polloc and at all the ports on the coast between Zamboanga and Polloc (*Lat. 7° 21′ N., Long. 124° 13′ E.*). On the coast, with a rising tide, the stream sets northward, north-westward and westward, according to local configuration. At Polloc harbour, with the rising tide, the stream sets eastward on the northern shore, and follows the bend of the coast southward and westward; the ebb stream sets in the reverse direction.

There are usually two tides in the lunar day, but, when the moon is in greatest declination at about neaps, single day tides occur. These astronomical conditions occur at about the equinoxes.

Charts 957, plan of Palak harbour, 3811.

Coast.—Lalabugan bay lies in the south-eastern part of the bight between Tugapangan point and Matimus point, 3¼ miles north-north-westward. In the north-eastern and south-eastern parts of the bay are two small inlets, at the head of which are sand beaches and a few houses. Between these inlets, and north-eastward of them, the land is high, and covered with grass and trees. The shore is rocky and fringed by a coral reef; the southern shore consists of alternate sand beaches and rocky points. There are considerable depths in the bay which is open westward, and it does not afford a good anchorage.

Chart 3811.

Tetian bay, entered northward of Matimus point, affords good anchorage to vessels with local knowledge, especially in the northern part. Matimus point is 322 feet (98^m^1) high, and wooded; it is bordered by low rocky bluffs and fringed by a narrow reef. Barrel rock, the largest of three rocks lying about half a cable northward of Matimus point, is 24 feet (7^m^3) high, and very steep, with a solitary tree at its summit. These rocks form the south-western entrance point of Tetian bay, and may be passed at a distance of 1¼ cables.

Two shoals, with depths of one foot and 4 fathoms (0^m^3 and 7^m^3) over them, lie about 2 and 4½ cables, respectively, offshore, about 8½ cables southward of the 322-foot (98^m^1) hill on Matimus point.

The northern shore of Tetian bay is low and sandy, while the eastern shore is composed of alternate sandy beaches and rocky points. Matimus river, with the village of the same name at its mouth, flows into the head of the bay; the mouth of the river nearly dries.

Between the north-eastern entrance point of Tetian bay and the mouth of Malabang river, about 9 miles north-north-westward, the coast is mostly bordered by sand, with trees and bushes, and fringed by a steep-to reef, which, in some places, extends about half a mile offshore. About 4 miles northward of Matimus point the Balabagan river flows out, and 1½ miles north-north-westward of the entrance to the river is Salauang point, which is low, sandy, covered with trees, and fringed by a reef which extends half a mile offshore. The land for a distance of 3 miles inland is low and wooded, but farther inland it rises to mountain peaks with an elevation of about 4,000 feet (1,219^m^2).

Charts 943, 1263.

Chart 3811.

About one mile northward of Salauang point is the mouth of the Lalabuan river which nearly dries, and the village of the same name on the northern bank. Close north-westward of the entrance to the river is a rocky point with a few off-lying rocks which dry.

Off-lying dangers.—Pinatayan shoal (*Lat. 7° 28′ N., Long. 124° 06′ E.*), with a least depth of 9 feet ($2^{m}7$) over it, and steep-to, lies about 2¼ miles west-north-westward of Matimus point. The channel between them is clear of dangers and deep.

Buford reef, with a depth of 2 fathoms ($3^{m}7$) over it, and steep-to, lies about 3¾ miles west-south-westward of Salauang point. A 19-foot ($5^{m}8$) patch lies about 6 cables northward of Buford reef.

A shoal, with a depth of 10 feet ($3^{m}0$) over it, lies about 1¾ miles west-north-westward of Salauang point, and nearly 1½ miles offshore. There is a deep channel three-quarters of a mile wide between this shoal and the coastal reef.

A 19-foot ($5^{m}8$) patch, which is steep-to, lies 2½ miles westward of the southern blockhouse at Malabang, and 1½ miles offshore.

Malabang.—The town of Malabang is situated about three-quarters of a mile up the Malabang river, which is only navigable by small boats. There is a prominent building painted black, with two white diamonds on the seaward face on the beach. The radio tower, also painted white, is prominent.

Dos Hermanos peaks are two round-topped peaks connected by a saddle, lying about 6 miles north-eastward of the mouth of the Malabang river. These peaks lie about three-quarters of a mile apart in a north-westerly and south-easterly direction, and are 2,671 and 2,661 feet ($814^{m}1$ and $811^{m}1$) high, the north-western one being the higher.

Radio station.—There is a radio station at Malabang. *See* page 14.

Anchorage.—The usual anchorage off Malabang is in a depth of 12 or 15 fathoms ($21^{m}9$ or $27^{m}4$), about 3 or 4 cables southward of the prominent building on the beach.

Directions between Malabang and ports southward.—A vessel leaving the anchorage at Malabang, should steer south-westward until Tugapangan point, bearing about 143°, is well open south-westward of Matimus point. From this position she should steer for Matimus point, passing south-westward of the 10-foot ($3^{m}0$) patch off Salauang point and north-eastward of Pinatayan shoal. When approaching Matimus point, she should alter course southward to give it a berth of one mile, and then steer to pass half a mile off Tugapangan point.

Coast.—Mataling river, which nearly dries at its mouth, flows out about half a mile north-westward of Malabang river. Between the entrance to the Mataling river and the entrance to Port Baras, 3¼ miles north-westward, the coast is low and sandy, and bordered with trees and bushes; for about 3 miles inland the land is low and wooded.

Port Baras is about three-quarters of a mile wide at its entrance between Ibus island and a point about three-quarters of a mile north-westward of it. There are considerable depths in the middle of the bay but the head and eastern part are shallow. About 3 miles inland, are high, densely wooded hills.

Ibus island (*Lat. 7° 38′ N., Long. 124° 01′ E.*), **115** feet ($35^{m}0$) high

Charts 943, 1263.

Chart 3811.

to the tops of the trees, lies 1½ cables from the mainland, with shoal water between. The southern part of the island is high with a rocky shore, while the northern part is low with a sandy beach.

Between the north-western entrance point of Port Baras and Lapitan point, about 1½ miles westward, the coast is bordered alternately by sandy beaches and low rocky points, inland of which it is somewhat hilly and covered with trees and grass. Lapitan point is rather low and flat, and mostly covered with tall grass; it is rocky with low bluffs. Immediately within the point the land rises to an elevation of 400 feet (121^m9), and thence rises gradually to the mountains inland, which have a general elevation of about 2,500 feet (762^m0). The small village of Damitan stands on the right bank of a stream of the same name between Lapitan point (*Lat. 7° 39′ N., Long. 123° 58′ E.*) and Port Baras; from here a valley extends some distance inland.

The coast between Lapitan point and Sigayan point, 13 miles west-north-westward, is clear of dangers and fairly steep-to. It consists of a number of bold points with small bays between them. There are several unimportant villages scattered along this stretch of coast. From seaward the land appears mountainous, without any prominent peak except Mount Iniaoan, situated about 11½ miles north-eastward of Sigayan point; it is fairly conical in shape, wooded, and 5,204 feet ($1{,}586^m2$) high.

Tuka bay is entered about one mile northward of Lapitan point, and is only about half a mile wide. The head of the bay is fringed with mangroves, and reefs extend from both sides. The village of Tuka stands on the bluff near the eastern side of the bay. Between Tuka bay and Magapu point, 4¼ miles north-westward, the coast is bordered by a sandy beach. Subuan river, which flows out about 2 miles eastward of Magapu point, is about a quarter of a cable wide at its mouth, and has a depth of one foot (0^m3) on its bar. This river drains a large valley which is cultivated and inhabited by Moros between Magapu and Lapitan points.

Magapu point consists of three steep-to headlands, rising to an elevation of 1,094 feet (333^m5) about 3¼ cables within and is very prominent. Between Magapu point and Selungan point, 4¾ miles westward, the coast is alternately sandy and rocky. About half a mile westward of Magapu point there is a rocky islet, 44 feet (13^m4) high, with a few trees on it. Between Selungan point and Sigayan point the coast is bordered mostly by a sandy beach, within which there is an extensive valley, partly cultivated.

Anchorages.—In most places along the coast between Lapitan and Sigayan points, the depths are too great for anchoring. Anchorage may, however, be obtained close offshore, in a depth of 20 fathoms (36^m6), off the mouth of Subuan river, and westward of Magapu point. Good anchorage may be obtained from one to 2 miles westward of Selungan point. The tidal streams set north-westward and south-eastward, parallel with the coast.

Coast.—Sigayan point is over 100 feet (30^m5) high, wooded, and steep-to. About half a mile southward of the point there is a reef with a depth of 22 feet (6^m7) over it, with a deep channel between. Sigayan bay is entered between Sigayan point and Semaruga point, about 2¾ miles north-westward. The shores of the bay rise gradually to an elevation of 100 feet (30^m5), and thence steeply to a ridge,

Charts 943, 1263.

Chart 3811.

about 1,000 feet ($304^{m}8$) high. Semaruga point (*Lat.* 7° *44′ N., Long.* 123° *44′ E.*) is a well-wooded promontory, 130 feet ($39^{m}6$) high, connected with the mainland by a low isthmus; it is clear of dangers and steep-to.

Anchorage, well protected from northerly winds, may be obtained, in a depth of 20 fathoms ($36^{m}6$), sand, near the head of Sigayan bay.

A chain of dangerous detached reefs, with a least depth of 9 feet ($2^{m}7$) over them, extends from about 1½ miles north-westward of Semaruga point for a distance of about 7 miles north-westward, where it connects with the coastal reef about 2 miles south-eastward of Calibon point. These reefs are steep-to on their seaward sides. There are several channels between the reefs and under favourable conditions vessels with local knowledge can proceed inside them.

Caromata bay, entered between Semaruga point and Dugolaan point, 4¾ miles north-north-westward, is fronted by the chain of reefs described above. It is clear of dangers inside except for two coral patches, with a depth of 2 fathoms ($3^{m}7$) over them, lying about a quarter of a mile offshore, about 2 and 3 miles, respectively, northward of Semaruga point, and Dato rock, 5 feet ($1^{m}5$) high, which lies about 1½ cables offshore and one mile northward of the same point. Elsewhere the depths shoal gradually, affording anchorage in a depth of about 20 fathoms ($36^{m}6$), mud.

The greater part of the coast between Dugolaan point and Calibon point consists of mangrove swamps, with flat, densely-wooded land within. Coral reefs, which partly dry, fringe this part of the coast and extend about 3½ cables offshore in places. Dugolaan point is surmounted by a hill, 335 feet ($102^{m}1$) high, and is steep-to and clear of dangers.

The coast farther north-westward has been described on page 270.

SOUTHERN SIDE OF MINDANAO (*continued*).—**Coast.—Dangers.**—The coast north-eastward of Tapian point, on the eastern side of the entrance to Illana bay, has been described on page 271.

Between Tapian point and Quidapil (Kidapil) point, about 21 miles south-south-westward, the land in the vicinity of the coast is mountainous, there being only small areas of low land at the mouths of the Kinemi and Landassan rivers, and at the head of Resa bay. Mount Binaca (Binaka), situated about 12 miles southward of Tapian point and about 2¾ miles inland, has an elevation of 3,350 feet ($1{,}021^{m}0$), and is the highest mountain in the coastal ridge; its summit is wooded, but its sides are covered with tall grass, bushes, and clumps of trees. The coastal mountains in general are covered with tall grass and bushes, and the coast is bordered with trees overhanging beaches of rock, sand or gravel. The country is sparsely inhabited.

Mount Blik, 4,021 feet ($1{,}225^{m}6$) high, lies near the northern end of the higher inland range of mountains which extends south-eastward, and about 12 miles eastward of Mount Binaca; it is an excellent mark. Northward of Mount Blik lies the wide valley of Mindanao river, and southward the land between it and the mountain south-eastward of Port Lebak (page 279) appears comparatively low; but the latter is frequently obscured by clouds.

A weak northerly current is experienced off this coast, but there is a current in the reverse direction close off the coastal reef. The

Charts 2575, 943, 1263.

Chart 3811.

coast is generally steep-to, depths of 50 fathoms ($91^{m}4$) being found less than half a mile offshore.

Manangula point (*Lat. 7° 06′ N., Long. 124° 02′ E.*), 3 miles south-south-westward of Tapian point, and Tenotungan point, 4 miles farther in the same direction, are low. At Manangula point there is a large coconut plantation, and on the southern side of the point Matabal river discharges; it can be entered by a boat at half tide, but the channels frequently change during the rainy season. At Tenotungan point there is a village which shows up well between the coconut trees. Between this point and a shoal, with a depth of 3 fathoms ($5^{m}5$) over it, close offshore about three-quarters of a mile northward, small vessels with local knowledge may obtain anchorage, in depths of from 10 to 12 fathoms ($18^{m}3$ to $21^{m}9$), sand, abreast a short stretch of sandy beach.

Logung point, 5¼ miles southward of Tenotungan point, and Tagata point, about 4½ miles farther southward, are fairly prominent, the former having a grass-covered knoll, 320 feet ($97^{m}5$) high. Kinemi is a small settlement situated 1¾ miles northward of Tagata point. A sand and rocky reef, with a depth of 2 fathoms ($3^{m}7$) over it, lies about three-quarters of a mile south-south-westward of Logung point. All the other dangers lie less than half a mile offshore and are steep-to.

Resa bay, entered between Tagata point and Liess point, 2¼ miles southward, is open westward and is only tenable in fair weather. Lassak and Lapacon rivers flow into the head of the bay. Several shoals of rock and sand, with depths of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$) over them, lie offshore, within half a mile of the mouth of Lassak river. The best anchorage for vessels with local knowledge is about half a mile northward of the mouth of Lapacon river, in depths of from 17 to 23 fathoms ($31^{m}1$ to $42^{m}1$), sand.

Quidapil point is a prominent landmark, appearing as an island when first seen from northward or southward; it is formed by a narrow ridge, 350 feet ($106^{m}7$) high, covered with grass and bushes. The point is steep and rocky, with large loose rocks and a coral reef which dries. Mount Corobong (Korobong), 2,350 feet ($716^{m}3$) high, and covered with tall grass, is a prominent peak lying 2¾ miles eastward of Quidapil point. About 3½ miles south-eastward of the point is Linao point, which is rocky with large detached rocks on a coral reef which dries. Sadam bay, northward of Linao point, is almost entirely fringed by coral and mangrove. There is, however, a break in the reef on the western side of the bay, where small boats may land in rough weather.

Off-lying danger.—Huidobro reef, with a least depth of 19 feet ($5^{m}8$) over it, coral and sand, lies about 2 miles south-westward of Linao point; it is readily visible from a safe distance. There is a deep channel between the reef and the point.

Coast.—Linao bay is entered between Linao point and Kalingmomo point, 3¾ miles south-eastward. The shore consists of sand and hard mud, with bushes and trees at the high-water line. Two reefs, with depths of 7 and 12 feet ($2^{m}1$ and $3^{m}7$) over them, lie about 8½ cables from the north-eastern and northern shores of the bay, respectively. About midway between the latter reef and the north-western shore is a reef with a depth of about 4 feet ($1^{m}2$) over it. The best anchorage for vessels with local knowledge is in the northern part

Charts 2575, 943, 1263.

Chart 3811.

of the bay, off Mati, in depths of from 7 to 11 fathoms ($12^{m}8$ to $20^{m}1$). Tran village stands on Kalingmomo point at the mouth of Tran Grande river. This river can be entered at any state of the tide by small boats.

Between Kalingmomo point and Lebak point, about 10 miles southward, the country is low, flat and wooded; a mountain range, from about 1,000 to 2,000 feet ($304^{m}8$ to $609^{m}6$) high, lies about 4 miles inland, parallel with the coast. There are no off-lying dangers on this stretch of the coast. A rocky reef, with two rocks awash, lie a quarter of a mile north-westward of the rocky point situated one mile northward of Lebak point. A deep channel, about one cable wide, lies between the reef and the coast. Lebak point (*Lat. 6° 33′ N., Long. 124° 02′ E.*) rises to an elevation of 340 feet ($103^{m}6$) about 3 cables within.

Chart 957, plan of Port Lebak.

Port Lebak.—Port Lebak is about 8½ cables wide at its entrance between Lebak point and Nara point, south-south-westward of it. It affords the best protected anchorage in this part of Mindanao, and is easy of access; the depths decrease gradually towards the head where there is ample swinging room for moderate-sized vessels.

Lebak islet, 37 feet ($11^{m}3$) high, lies near the outer edge of a reef which extends a quarter of a mile south-south-westward from Lebak point. Tubotubo islet, 110 feet ($33^{m}5$) high, lies within three-quarters of a cable of the outer end of a reef, which dries, extending about 3½ cables north-westward from the southern side of the port. About midway between Tubotubo islet and the southern shore, lying on the same reef is an islet, 30 feet ($9^{m}1$) high. The shores of the port are bordered with mangrove in places, and fringed by a coral reef, which, on the northern shore, dries and extends 1¾ cables offshore.

Anchorage may be obtained, in depths of from 16 to 18 fathoms ($29^{m}3$ to $32^{m}9$), mud, eastward of Tubotubo islet, or north-eastward of Lebak islet, in depths of from 14 to 16 fathoms ($25^{m}6$ to $29^{m}3$).

The settlements of Kalamansig and Lebak are situated on the northern and southern shores, respectively.

Radio station.—There is a radio station at Lebak. *See* page 14. The steel framework mast of this station, situated on the northern side of the port, is prominent.

Chart 2575.

Coast.—Between Nara point and Tuna point, about 10 miles southward, the coast is indented, and the land, which is densely wooded, rises steeply. The only low land lies northward of Sangay point, situated about 3 miles north-north-westward of Tuna point, along the valley of the Sangay river, which leads to the coastal mountains. Mount Syniop, 1,730 feet ($527^{m}3$) high, lies 5½ miles northward of Tuna point and about one mile inland. It is conical in shape near the summit, densely wooded, and is the most prominent peak near the coast. This mountain and others in the coastal range merge into the higher mountains in the interior.

Off-lying dangers.—Donauang shoals is a chain of shoals lying parallel with the coast, with depths of from 10 to 27 feet ($3^{m}0$ to $8^{m}2$), extending for a distance of about 4 miles. The northernmost and outer danger has a depth of 25 feet ($7^{m}6$), sand and coral, over it, and lies about 3 miles west-south-westward of Lebak point. The southernmost shoal is a 16-foot ($4^{m}9$) patch lying about one mile offshore,

Charts 943, 1263.

Chart 2575.

with a 10-foot ($3^{m}0$) patch 1½ cables northward of it. All these reefs are steep-to, and there is a deep passage, with a least width of about three-quarters of a mile between them and the coast.

Chart 957, plan of Basiauang bay.

Basiauang bay.—Basiauang bay is entered between Basiauang point, situated 3¾ miles southward of the southern entrance point of Port Lebak, and Donauang island, about a mile south-westward of Basiauang point. The great depths make anchoring difficult though small boats can find some protection on either the northern or southern side of the bay.

Donauang island (*Lat. 6° 28′ N., Long. 124° 01′ E.*), about 300 feet ($91^{m}4$) high, and densely wooded, is a good landmark for vessels approaching from the north or south. It is fringed by a reef which extends about one cable from the southern and western sides and 1½ cables from the northern side ; depths of less than 5 fathoms ($9^{m}1$) extend about 1½ cables farther northward. A deep channel, about one cable wide between the reefs on either side, separates the island from the mainland eastward. Vessels not calling at this bay or at Port Lebak should keep about 5 miles offshore, to avoid the Donauang shoals.

Chart 2575.

Coast.—Tuna bay, entered southward of Tuna point, is open southward, and a heavy swell sets in during the South-west monsoon. Tuna point is a prominent rocky point with a narrow rocky shelf, on which there are several rocks, which dry about 5 feet ($1^{m}5$). The western shore of the bay is fringed by a coral reef, which, near the northern end, extends about 2 cables southward from the edge of a mangrove swamp ; close off the swamp is an islet, 20 feet ($6^{m}1$) high. The eastern shore is bordered mostly by a sandy beach with a few patches of rock and gravel.

Moderate-sized vessels with local knowledge may obtain anchorage near the head of Tuna bay, in depths of from 18 to 20 fathoms ($32^{m}9$ to $36^{m}6$), mud, protected from all except southerly winds.

Between Tuna bay and the entrance to Sarangani bay, about 70 miles east-south-eastward, high, densely wooded mountains extend along the coast, their summits being from about 2 to 4 miles inland. Two conical peaks, about 3 miles northward of Bacud point (page 282), are very prominent when seen from westward or south-eastward. Depths of 100 fathoms ($182^{m}9$) are found at a distance of less than 2 miles offshore. Following the general direction of the coast a vessel can safely keep at a distance of 5 miles, the outer danger lying less than 3 miles offshore. A current sets south-eastward at a rate of from half a knot to one knot, but close inshore it sets in the opposite direction.

Malatuna point, 4¾ miles south-eastward of Tuna point, may be easily identified from north-westward or south-eastward by an islet, 80 feet ($24^{m}4$) high, lying close off it. Taytayan islet, 120 feet ($36^{m}6$) high, and wooded at its summit, lies close offshore, about 2¾ miles south-eastward of Malatuna point ; the channel between the islet and the mainland is shallow. The western side of the islet is steep-to, but rocks, which dry, lie one cable southward of it. About 1½ miles south-eastward of Taytayan islet is Cadiz point, and 3¾ miles farther is Palimban point, which is low. Pola point (*Lat. 6° 19′ N., Long. 124° 15′ E.*), about 6 miles south-eastward of Palimban point, is 460 feet

Charts 943, 1263.

(140^{m}2) high, with a prominent rocky bluff; it shows up well from westward and south-eastward.

Off-lying dangers.—An 8-fathom (14^{m}6) patch lies 1¾ miles south-westward of Malatuna point, and another 8-fathom (14^{m}6) patch lies about 1¼ miles south-westward of Taytayan islet. From a position about 1½ miles westward of Cadiz point to 2 miles south-eastward of Pola point there is a chain of reefs which lies from half a mile to 1¼ miles offshore; these reefs lie on the edge of the 100-fathom (182^{m}9) line and are steep-to. At the northern end of the chain there is a shoal with a depth of 10 feet (3^{m}0) over it, and about 2½ miles westward of Pola point and one mile offshore there is a sand cay. Canipan reef, with a depth of one fathom (1^{m}8) over it, lies 1¾ miles south-south-westward of Cadiz point (*Lat. 6° 16′ N., Long. 124° 09′ E.*), and a shoal, with a depth of 22 feet (6^{m}7) over it, lies 1½ miles southward of the same point. Between these two dangers there is a deep channel about one mile wide.

The channels between the reefs and between them and the coast are deep and clear of danger, but the reefs are difficult to distinguish on account of the discoloured water from the rivers in the vicinity. Anchorage may be obtained by vessels with local knowledge in the channel between the reefs and the coast, in depths of from 15 to 20 fathoms (27^{m}4 to 36^{m}6).

Milbuk harbour.—Beacons.—Milbuk harbour lies eastward of Pola point. The approach is encumbered by several reefs, some of which dry, lying about half a mile offshore. The shores of the harbour are fringed with reefs which dry, extending from half a cable to 2 cables offshore. There is a detached reef, with a least depth of 7 feet (2^{m}1) over it, lying about 3½ cables southward of the pier-head at Milbuk.

There are two leading beacons, privately maintained, which, in line, bearing 005°, lead between the outer reefs. The front beacon consists of a pole surmounted by a white inverted triangle, situated on the beach about three-quarters of a cable westward of the pier; the rear beacon consists of a white triangle on a prominent tree on the skyline of the first ridge northward of the town.

A wooden pier, reported, in 1937, to be in ruins, is situated at Milbuk at the head of the harbour. Milbuk river flows out about 1¼ cables south-westward of the pier.

Anchorage may be obtained by vessels with local knowledge about three-quarters of a cable south-south-eastward of the head of the pier, in a depth of about 7 fathoms (12^{m}8), or farther out in depths of from 9 to 10 fathoms (16^{m}5 to 18^{m}3).

Coast.—The coast between Milbuk and Pinol point, 7¼ miles south-eastward, is bordered by sand and gravel, and is wooded to the high-water line. Maculi point, 4 miles south-eastward of Milbuk, is low; Kraan river flows out near the end of the point. A convenient anchorage may be obtained by vessels with local knowledge, in depths of from 14 to 20 fathoms (25^{m}6 to 36^{m}6), about 2 miles eastward of the mouth of Kraan river, and a quarter of a mile offshore. Pinol point is 220 feet (67^{m}1) high, with a prominent yellow cliff, 70 feet (21^{m}3) high.

Between Pinol point and Maguling point, 1¼ miles south-eastward, the coast is bordered by a coral reef which extends three-quarters of a cable offshore, and the land rises steeply from the water's edge. Pagang point, 8 miles south-eastward of Maguling point, is a sharp

Chart 2575.

rocky point, 70 feet (21^{m}3) high, with a prominent white scar on the south-eastern side. Between these two points the foreshore is low and flat with numerous rivers flowing out, some of which can be entered by a boat at half tide.

Bacud point (*Lat. 5° 59′ N., Long. 124° 36′ E.*), called Kiamba by the natives, lies 6 miles south-eastward of Pagang point. It is fringed by a reef which extends about one cable offshore, and on its outer edge is a rock, 26 feet (7^{m}9) high. The point consists of cliffs, 40 feet (12^{m}2) high, rising to a somewhat flat-topped peak, 760 feet (231^{m}6) high. The conical peaks, 1,700 and 1,810 feet (518^{m}2 and 551^{m}7) high, lying 2¾ miles north-north-eastward and 3½ miles northward, respectively, of Bacud point, are prominent, and readily identified when seen clear of the higher mountains in the interior.

Off-lying reef.—Bacud reef, with a depth of 3 feet (0^{m}9) over it and steep-to, lies 4¼ miles south-south-eastward of Bacud point and about 2½ miles offshore. This is the only off-lying danger in the vicinity.

Coast.—Dangers.—A bank, with depths of less than 3 fathoms (5^{m}5) over it, extends as much as three-quarters of a mile offshore between Kling, a small village situated at the mouth of Kling river, 6½ miles south-eastward of Bacud point, and a point about 3½ miles north-westward. A palm grove extends south-eastward along the coast for a short distance. A large white house near the beach on the south-eastern bank of Molegon river, 2 miles south-eastward of Kling, is prominent. Most of the country is densely wooded. A rock, with a depth of 25 feet (7^{m}6) over it, and steep-to, lies about half a mile south-westward of the mouth of Keybalis river, which flows out 3 miles south-eastward of the mouth of Molegon river.

Bual point, 14½ miles south-eastward of Bacud point, is low and wooded; it is fringed by a reef which extends about one cable offshore. At Pananag, about 2 miles east-south-eastward of Bual point, there is a long building, very prominent from southward. Matil point, about 6½ miles east-south-eastward of Bual point, consists of coral rock and sand; it is low and flat, with trees extending to within half a cable of its end. The beach consists of a narrow strip of sand and gravel, from which the hills rise abruptly to an elevation of over 2,000 feet (609^{m}6). At Taliak point, 6¾ miles farther eastward, the hills are not so high and are more rounded.

A chain of shoals, with depths of from 9 and 24 feet (2^{m}7 and 7^{m}3) over them, lies about three-quarters of a mile southward of Taliak point, and a 9-fathom (16^{m}5) patch lies 3 miles west-south-westward of the point and about 2 miles offshore. A shoal, with a depth of 9 feet (2^{m}7) over it, lies half a mile southward of Kamanga point, situated about three-quarters of a mile eastward of Taliak point. There is a deep channel between this shoal and the eastern end of the chain of shoals southward of Taliak point. About three-quarters of a mile eastward of Kamanga point is a conspicuous cliff, 50 feet (15^{m}2) high, and Tampuan point, about 1¾ miles north-eastward of the cliff, is marked by prominent vertical cliffs, 35 feet (10^{m}7) high.

Sarangani bay.—Sarangani bay is entered between Tampuan point and Sumbang point, 6 miles east-south-eastward. Near the entrance the land rises steeply from the shore, the hills on the eastern side being densely wooded, while those on the western side are covered

Charts 943, 1263.

Chart 2575.

with tall grass, only the lower slopes being wooded. At the head of the bay the land is flat, but rises gradually to the mountains inland.

Mount Matutum, 7,524 feet (2,293^{m}3) high, lies 29 miles northward of Tampuan point (*Lat. 5° 52′ N., Long. 125° 05′ E.*), and is a prominent mark when free from clouds.

Owing to the great depths, Sarangani bay affords poor anchorages in the various bights. There are no dangers which lie more than half a mile offshore. The edge of the fringing reef is generally marked by rocks which dry about 4 feet (1^{m}2).

Makar, in the north-western corner of the bay, is the shipping place for the produce of the Sarangani valley.

Charts 957, plan of Kanalasan cove, 2575.

Sumbang point is marked by a prominent bare white cliff, 50 feet (15^{m}2) high. Southward of the point the trees grow down to the high-water line, and numerous rocks, eroded from the cliff face, lie along the fringing reef, which dries about one foot (0^{m}3). There is also a prominent white cliff northward of Tango point, 3½ miles north-north-eastward of Sumbang point.

Kanalasan cove, on the eastern side of Sumbang point, is the best anchorage, during the South-west monsoon, in Sarangani bay. At the head of the cove, situated on the left bank of the Glan river, is the village of Glan, where there is a pier, with depths, in 1937, of from 12 to 18 feet (3^{m}7 to 5^{m}5) at its head, alongside which small vessels can lie. The depths increase rapidly off the end of the pier. The police barracks at Glan are prominent. At Lun point, about 13 miles north-north-eastward of Sumbang point, shallow water extends about 3 cables westward.

Anchorages.—Anchorage may be obtained by vessels with local knowledge in Kanalasan cove, in depths of from 9 to 15 fathoms (16^{m}5 to 27^{m}4), one cable north-westward of the head of the pier at Glan.

Chart 2575.

Anchorage may be obtained by vessels with local knowledge in Sapu bay, on the eastern shore of Sarangani bay, about 7 miles north-north-eastward of Sumbang point, in depths of from 20 to 25 fathoms (36^{m}6 to 45^{m}7), protected from southerly and south-westerly winds.

Lago cove, about 8 miles northward of Sapu bay, affords anchorage to vessels with local knowledge, in a depth of about 20 fathoms (36^{m}6), but the area is very restricted.

Anchorage may be obtained by vessels with local knowledge, in a depth of 20 fathoms (36^{m}6), off Makar. The anchorage area is small, but is somewhat protected from the southerly wind and sea that prevail almost every afternoon, and the cove affords a safe landing place.

Landmarks.—Near the southern end of the peninsula which extends southward between the eastern side of Sarangani bay and the southern approach to Davao gulf are Saddle peak, 3,687 feet (1,123^{m}8) high, situated about 11 miles north-north-eastward of Tinaca point, the southern extremity of the peninsula, and Dome peak, 1,950 feet (594^{m}4) high, 3½ miles northward of the same point. These peaks are prominent; Dome peak is often visible when the higher mountains are obscured by clouds. Another prominent landmark is the volcano on Balut island, situated about 8 miles south-south-eastward of Tinaca point, *see* page 285.

Charts 943, 1263.

Chart 2575.

Coast. — Dangers. — Light. — Lefa point, 3¾ miles southward of Sumbang point, is very steep and rocky, with numerous large rocks lying close off it. There are two small bights on the northern side of the point, with light sandy beaches. Between Lefa point and Sagby point, 4 miles south-eastward, there is a bay with several shoals, with depths of 16 and 28 feet ($4^{m}9$ and $8^{m}5$), over them. Sagby point is marked by a red cliff. A shoal, with a depth of 33 feet ($10^{m}1$) over it, lies about one mile south-south-westward of the point, and a 7-fathom ($12^{m}8$) patch lies 1¾ miles south-westward of the shoal.

Between Mantalakan point, situated about 1½ miles south-eastward of Sagby point, and Hagdan point, about 8 miles farther south-eastward, there is a bight with great depths. A shoal, with a depth of 6¼ fathoms ($11^{m}4$) over it, lies about one mile south-south-eastward of Hagdan point.

Tinaca point, the southern extremity of Mindanao, consists of two headlands connected by a beach ; it is clear of dangers and steep-to.

A light is exhibited, at an elevation of 140 feet ($42^{m}7$), from a white concrete beacon, on Tinaca point.

A shoal, with a depth of 21 feet ($6^{m}4$) over it, sand and rock, lies 1½ miles eastward of Tinaca point, and about midway between them a bank, with a depth of 16 feet ($4^{m}9$) over it, extends about three-quarters of a mile offshore. Balangonan cove, about 2 miles east-north-eastward of Tinaca point, affords indifferent anchorage. Malavinuan cove, about one mile farther eastward, affords sheltered anchorage to vessels with local knowledge during the North-east monsoon, in depths of from 12 to 16 fathoms ($21^{m}9$ to $29^{m}3$). Eastward of this cove the reef fringing the coast extends a quarter of a mile offshore ; outside the well-defined coastal reef there are no dangers.

Bukid point (*Lat. 5° 34′ N., Long. 125° 24′ E.*), 5 miles east-north-eastward of Tinaca point, is low and sloping, with a little reef off it. Kamalian cove, about half a mile northward of Bukid point, affords a deep and poor anchorage. Between this cove and Silacay point, 3 miles north-north-eastward, the coast is fringed by a reef which extends a short distance offshore. About 2 miles north-north-eastward of Kamalian cove is another cove which affords good anchorage for small craft with local knowledge close offshore ; the depths are considerable almost up to the beach. Fort Holland is a small settlement on the northern shore.

Butulan cove, close northward of Silacay point, affords temporary anchorage to small vessels with local knowledge protected from the swell, but exposed to the heavy sea that is caused by cross tidal streams. There are considerable depths in the cove, there being 14 fathoms ($25^{m}6$) close offshore, and 10 fathoms ($18^{m}3$) at the mouth of the river which flows into the head of the cove, but a bank, with a depth of one fathom ($1^{m}8$) over its outer end, extends one cable southward from the northern entrance point.

Between Butulan cove and Banos point, about 22 miles north-eastward, the coast is clear of dangers except for small reefs which extend a short distance from the points and fringe the coast at intervals. Landing is feasible all along this coast on sand and rocky beaches even during moderate north-easterly winds, when the projecting points offer some protection from the north-easterly swell. The coastal hills are generally densely wooded to their summits.

Charts 943, 1263.

Chart 2575.

During the South-west monsoon anchorage may be obtained by vessels with local knowledge about half a mile offshore, in a depth of 13 fathoms (23^{m}8), southward of Malalan point, situated 9½ miles north-eastward of Silacay point; also half a mile offshore, in a depth of 15 fathoms (27^{m}4), southward of Banos point, and during the South-west monsoon one mile northward of the point, in a depth of 20 fathoms (36^{m}6).

Banos point is a prominent peaked ridge, the lowest and southernmost peak of which is 265 feet (80^{m}8) high. A 37-foot (11^{m}3) patch lies about half a mile south-south-westward of the point.

Tidal streams.—Between Tinaca point and Sarangani islands the tidal streams set west-south-westward and east-north-eastward. Off the coast north-eastward they set northward and southward, the latter having less strength than the former; northward of Calian point, 12 miles north-north-eastward of Banos point, the tidal streams are weaker. Strong tide races and violent eddies are prevalent off Banos point.

Sarangani islands.—Light.—Sarangani islands, consisting of Balut and Sarangani islands and Olanivan islet, are separated from the southern extremity of Mindanao by Sarangani strait, a deep channel with a least width of 5½ miles. The islands are sparsely populated. The channel between Balut and Sarangani islands is 1½ miles wide and deep in the fairway, but the navigable channel is reduced to a width of three-quarters of a mile by the reefs extending from either side. In this channel the tidal streams attain a considerable rate; strong eddies occur on both sides of the channel and heavy tide-rips have been observed off each entrance.

Balut island, the western of the two, is the higher and more cultivated, though in general densely wooded to its summit. In the centre of the island there is a volcano, from which smoke sometimes issues, having an elevation of 2,895 feet (882^{m}4); south-westward of this peak is another volcano, and near the south-eastern point is a hill, 1,070 feet (326^{m}1) high. On the north-western side of the island, close inshore, are two hot springs.

A light is exhibited, at an elevation of 251 feet (76^{m}5), from a framework tower, at the western extremity of Balut island.

The coast is bordered by a reef, which, in places on the northern and eastern sides of the island, extend about 3½ cables offshore. Close off the south-western point is Manamil islet (*Lat. 5° 22′ N., Long. 125° 21′ E.*), 124 feet (37^{m}8) high. Lajan point, the north-eastern point of the island, is low and mostly covered with mangrove.

Anchorage may be obtained by vessels with local knowledge from half a mile to 1½ miles southward and south-eastward of Lajan point, in depths of from 5 to 20 fathoms (9^{m}1 to 36^{m}6), with good shelter from south-westerly or north-easterly storms, but the anchorage is encumbered with shoals.

Sarangani island consists of small undulating hills, the highest, near the northern extremity, having an elevation of 610 feet (185^{m}9). The entire coast is bordered by reefs, which extend over half a mile from the north-eastern side, also about 3½ cables from either side of the entrance to a small inlet on the eastern side, about 2½ miles from Panguil Bato point, the southern extremity of the island; reefs extend about three-quarters of a mile from the western side south-

Charts 943, 1263.

Chart 2575.

ward of Port Bolay. A detached rock lies about a quarter of a mile from the north-eastern point of the island, and a 37-foot ($11^{m}3$) patch lies about three-quarters of a mile from the eastern side and about 1¾ miles south-eastward of the north-eastern extremity.

Port Patuco, on the north-western side of Sarangani island, is entered about one mile south-south-westward of Batulayol point, the northern extremity of the island. The entrance, which may be identified by a red cliff close northward of it, is about 2¼ cables wide, but the navigable channel, in which there is a least depth of about 5 fathoms ($9^{m}1$), is only about a quarter of a cable wide between the reefs extending from either side. Small craft with local knowledge may obtain a sheltered anchorage in Port Patuco, in a depth of about 28 feet ($8^{m}5$), at the head, or in a depth of 7 fathoms ($12^{m}8$), about half a mile inside the entrance.

Tiain point, about 2¼ miles south-south-westward of Batulayol point, is steep-to, and may be identified by a prominent grey cliff. A 27-foot ($8^{m}2$) patch lies three-quarters of a mile northward of Tiain point and in the western approach to Port Patuco.

Chart 957, plan of Port Tumanao.

Port Tumanao, on the western side of Sarangani island, is entered about 6 cables south-south-eastward of Tiain point. The entrance is about 3¾ cables wide, but the navigable channel, which is deep, is reduced by shoals extending from either side to a width of about 1¼ cables. The northern side of the entrance may be identified by a conspicuous white mark on a rocky bluff. Good anchorage may be obtained, in a depth of 15 fathoms ($27^{m}4$), about 1½ cables from the head of the port, or in a depth of 28 fathoms ($51^{m}2$), in mid-channel about 5½ cables from the head.

Chart 957, plan of Port Bolai.

Port Bolay (Bolai), entered about 2 miles southward of Tiain point, is about one cable in width, and is suitable only for small craft, which may obtain anchorage at its head, in a depth of about 5 fathoms ($9^{m}1$).

Chart 2575.

Anchorage may be obtained by vessels with local knowledge off the eastern side of Sarangani island, along the coast for a distance of 2 miles northward of the inlet previously mentioned, in depths of from 12 to 15 fathoms ($21^{m}9$ to $27^{m}4$).

Olanivan islet (*Lat. 5° 31′ N., Long. 125° 29′ E.*) is a small flat cay lying about one mile northward of Sarangani island; it is 113 feet ($34^{m}4$) high to the tops of the trees, and is fringed by a reef which extends a quarter of a mile from its south-eastern side. Between this reef and that fringing the north-eastern side of Sarangani island there is a deep channel about half a mile wide.

DAVAO GULF.—Davao gulf, entered between Calian point and Cape San Agustin, about 30 miles east-north-eastward, is largely occupied in the northern part by Samal and Talicud islands. The depths in the greater part of the gulf are considerable; the dangers which fringe the western shore do not extend more than 1½ miles, and those on the eastern side, between Sigaboy island and Arena point, situated about 23 and 42 miles, respectively, northward of Cape San Agustin, lie at a maximum distance of 3½ miles offshore.

Charts 943, 1263.

Chart 2575.

WESTERN SIDE OF DAVAO GULF.—Coast.—Between Calian point (*Lat. 6° 07′ N., Long. 125° 42′ E.*) and Tubalan head, about 25 miles north-north-westward, are the villages of Talagutong, Lais, Malita, and Lacaron, the positions of which may be seen on the chart. From Lais northward the coast consists mostly of sand with coconut trees in places, and clear of dangers except for the fringing reefs at the points.

There are small piers at Lais and Malita. At Lais the recommended anchorage is north-eastward of the pier, and at Malita south-eastward. At both places the edge of the coastal bank is very steep-to. There is regular communication by launch between Lais, Malita, Lacaron and Davao.

Radio station.—There is a radio station at Malita. *See* page 14.

Coast.—Tubalan head, forming the eastern side of the port of the same name, is 558 feet (170^{m}1) high and prominent; the isthmus connecting the head with the mainland is low, giving the head the appearance of an island from a distance. The eastern and north-eastern sides of the headland are steep-to, and clear of off-lying dangers. A reef extends about 1½ cables from the north-western side.

The coast between Tubalan head and Colapsin point, about 13 miles north-westward, is the most indented part of the coast line in Davao gulf. From about one to 3 miles inland there are numerous and mostly sharp peaks, from about 600 to 1,750 feet (182^{m}9 to 533^{m}4) high. About 8 miles inland and separated by a pronounced valley from the coastal range are some peaks ranging in elevation from about 2,500 to 3,800 feet (762^{m}0 to 1,158^{m}2), which are generally covered with clouds. The ranges are not well defined and it is difficult to identify any particular peak. The whole area is densely wooded.

Port Tubalan is about three-quarters of a mile wide at its entrance between Tubalan head and Botak point, north-westward of it. There are considerable depths in the middle of the port, and the shores are fringed with coral. Basol islet, 42 feet (12^{m}8) high, is a steep and rocky bluff with a few bushes on its summit lying on the reef in the south-eastern part of the port. Botak point is 361 feet (110^{m}0) high, and slopes steeply to a rocky bluff, 40 feet (12^{m}2) high at the extremity. The sides of the point are fringed by narrow reefs, but the end is steep-to.

The best anchorages for vessels with local knowledge in Port Tubalan are on the western side of the port about a quarter of a mile offshore, in depths of from 20 to 22 fathoms (36^{m}6 to 40^{m}2), mud, and in the south-eastern corner, in depths of from 22 to 24 fathoms (40^{m}2 to 43^{m}9), mud, with Basol islet bearing 115°, distant about a quarter of a mile.

Between Botak point (*Lat. 6° 31′ N., Long. 125° 35′ E.*) and Sigarin point, about 2¼ miles north-westward, there are two indentations formed by Minaban and Babak points; they are free from danger except for the fringing shore reefs. Sigarin point terminates in a bluff, about 80 feet (24^{m}4) high, and is fringed by a coral reef with foul ground beyond it together extending nearly a quarter of a mile offshore.

Basiauan bay is about one mile wide at its entrance between Tambalan point, lying 1¼ miles westward of Sigarin point, and the coast westward of it. There are considerable depths in the middle of the

Charts 943, 1263.

Chart 2575.

bay and it is clear of dangers, but the shores are fringed by reefs which dry and which extend from one to 2¾ cables off, and a bank, with depths of less than 3 fathoms (5^{m}5) over it, extends 3¼ cables from the head of the bay. A reef, which dries, extends about a quarter of a mile north-westward from Tambalan point. Basiauan village stands on the western shore at the head of the bay, and Kumassie village on the western side of the entrance.

The best anchorage in Basiauan bay for vessels with local knowledge is at the head north-eastward of the village, in depths of from 14 to 16 fathoms (25^{m}6 to 29^{m}3), mud, sheltered from all winds except those from between north and north-north-east. The fringing reefs on either side of the anchorage are of a dark brown colour, and that on the western side dries.

Sibalatan point, about 2¼ miles north-westward of Sigarin point, may be easily identified from north-eastward as it terminates in a ridge over 200 feet (61^{m}0) high, extending southward. It is fringed by a coral reef with foul ground beyond together extending about a quarter of a mile offshore.

Between Sibalatan point and Kulungan point, about 3½ miles north-westward, there is a bay divided into two smaller bays by Kabalantian point; the south-eastern is Monkiaua bay, and the north-western Kulungan bay. The middle of Monkiaua bay is clear of dangers, but its shores are fringed with coral. In the north-western part of Kulungan bay are several shoals one of which is awash. Kulungan point is 340 feet (103^{m}6) high, and is easily identified by a sharp tongue of bare, rocky, yellow bluff extending some distance northward down to the water's edge. The point is fringed by coral which, however, only extends a short distance off.

A shoal, with a depth of 2 fathoms (3^{m}7) over it, lies about 1¾ miles south-eastward of Kulungan point and about 1¼ miles offshore.

From Kulungan point to Colapsin point, the coast is bold and rocky with stretches of sand beach, and is fringed with coral which extends about 1¾ cables offshore in places. Cliff point, lying about midway between these two points, is 390 feet (118^{m}9) high, and steep-to.

Colapsin point (*Lat. 6° 38′ N., Long. 125° 26′ E.*), 265 feet (80^{m}8) high, and well wooded, is fringed by a coral reef which extends 1¾ cables northward. A coral shoal, with a depth of 21 feet (6^{m}4) over it, lies about 6½ cables north-north-eastward of the point.

Malalag bay.—Dangers.—Beacon.—Malalag bay lies on the south-western side of the peninsula of which Colapsin point is the northern extremity. The eastern entrance point, situated 5½ cables west-south-westward of Colapsin point, rises to an elevation of 189 feet (57^{m}6), and is fringed by a coral reef which extends about 1¼ cables north-westward from it. The western shore of the entrance is fringed by mangroves, beyond which a bank, with depths of less than 3 fathoms (5^{m}5) over it, extends three-quarters of a mile, leaving a channel one mile wide into the bay.

Mount Piapi, 640 feet (195^{m}1) high, and densely wooded, lies close to the coast, about 3 miles west-north-westward of Colapsin point, and is a good landmark.

Malalag bay is backed by hills, and on the western side and at the head there are extensive mangrove swamps.

Piapi reef, which dries about one foot (0^{m}3), lies in the northern

Charts 943, 1263.

approach to Malalag bay, about one mile offshore eastward of Mount Piapi. Close north-eastward of the reef is a 9-foot ($2^{m}7$) patch.

Bolton reef, with a depth of 3 feet ($0^{m}9$) over it, and steep-to, lies in the middle of the entrance, and divides it into two deep channels, of which the western one is the wider and better. The reef is marked by a white concrete beacon, 17 feet ($5^{m}2$) high.

About three-quarters of a mile southward of the eastern entrance point and connected to the eastern shore by foul ground is an islet, 165 feet ($50^{m}3$) high. A reef extends about half a mile north-westward from the head of the bay, and at its outer end is an islet, 60 feet ($18^{m}3$) high.

Malalag village, known also as Bolton, is situated on the south-western shore of the bay; it is of little commercial importance.

Anchorage.—Directions.—The usual anchorage for vessels with local knowledge is, in a depth of 10 fathoms ($18^{m}3$), mud, about a quarter of a mile northward of the village, but it is bad in northerly winds which sweep down the gulf, and even with southerly winds there is some sea here. About one mile south-eastward of the village, and on the south-eastern side of a rocky bluff there is a fine sandy beach, which for a short distance is free from coral and steep-to; vessels can anchor close in here.

Vessels entering Malalag bay should pass about a quarter of a mile eastward of Piapi reef, and 1¼ cables westward of the beacon on Bolton reef.

Small craft may obtain a good protected anchorage, in a depth of about 20 fathoms ($36^{m}6$), between the islet near the head of the bay and the north-eastern shore.

Coast.—From Mount Piapi to Malusi point, 14¼ miles north-north-eastward, and thence to the mouth of Davao river, 15 miles farther north-eastward, the coast is low, but rises rapidly inland to a mountain range culminating in Mount Apo. This stretch of coast is densely wooded and intersected by several streams, none of which, however, is navigable by steam launches. At low water they are difficult to enter even with a small boat. The coast is fringed by reefs, and in some places there are detached reefs lying from one to 1½ miles offshore. The anchorages are poor and in many cases rendered difficult of access by the off-lying reefs.

Between the point on the coast eastward of Mount Piapi and the entrance to Umbakanan river, about 1½ miles northward, the coast is low, flat, and densely wooded inland; it is bordered by a flat sandy beach and mangroves, and fringed by sandy flats and coral reefs which nearly dry, extending about half a mile offshore. Padada river, which flows out 1½ miles northward of Umbakanan river, is the largest river in this vicinity. The village of the same name stands on the northern bank about half a mile inland. On the coastal reef about midway between the mouths of these two rivers there is a prominent clump of mangroves which forms an island at low water, situated about 2 cables offshore.

Between the mouth of Padada river and Digos point (*Lat.* 6° 45′ *N.*, *Long.* 125° 24′ *E.*), 3¾ miles northward, the coast is bordered by a beach of fine sand fringed with coral, extending not more than a quarter of a mile offshore. Bulatakay and Digos rivers flow out 2¾ miles and one mile, respectively, south-south-westward of Digos point. Digos

Chart 2575.

village stands on the northern bank of Digos river, about half a mile inland. A large iron warehouse, situated on the beach about 2 cables southward of the mouth of the river, is prominent. About 1¼ miles southward of the warehouse and 3½ cables offshore is a 3-fathom ($5^{m}5$) patch.

Digos islet is a white coral sand cay, about 2 feet ($0^{m}6$) high, with a few bushes on it, lying on a reef about one mile southward of Digos point and 3 cables offshore. This reef, part of which dries, extends about 1½ cables eastward from the islet.

Digos point is low, flat, wooded, and fringed with mangroves. A steep-to coral reef which dries, extends nearly a quarter of a mile eastward from the point. The point is fairly prominent from northward or southward; the channel between it and the Digos reefs is about 1¼ cables wide, with depths of from 7 to 13 fathoms ($12^{m}8$ to $23^{m}8$).

Off-lying dangers.—Digos reefs, lying within one mile north-eastward and eastward, and 1½ miles south-eastward of Digos point, dry about 2 feet ($0^{m}6$). There are several channels between the reefs, but vessels without local knowledge should not attempt to pass through them. Digos Outer reef, which dries about 4 feet ($1^{m}2$), lies about 1¾ miles south-south-eastward of Digos point (*Lat. 6° 45′ N., Long. 125° 23′ E.*); it is steep-to on its eastern and southern sides, but on its western side foul ground extends to a distance of about half a mile.

Two shoals, with depths of 31 and 39 feet ($9^{m}4$ and $11^{m}9$) over them, lie about half a mile south-south-westward and 4 cables southward, respectively, of Digos Outer reef.

Anchorages.—Directions.—Anchorage may be obtained by vessels with local knowledge, about 2 cables south-westward of Digos islet, in depths of from 12 to 15 fathoms ($21^{m}9$ to $27^{m}4$) with the warehouse bearing 317°, or about a quarter of a mile northward of the same islet, in depths of 11 or 12 fathoms ($20^{m}1$ or $21^{m}9$), with the warehouse bearing 249°. Small craft may anchor between the islet and the warehouse. To approach the southern anchorage a vessel should steer for the warehouse, bearing 332°, which will lead clear of the foul ground westward of Digos Outer reef; when Digos islet bears 000°, she should steer for it on that bearing until the warehouse bears 317°, which bearing will lead to the anchorage south-westward of the islet.

If Digos Outer reef is visible a vessel from northward may pass northward of it by steering for the warehouse, bearing 285°, open southward of Digos islet, which will lead through a channel about 2 cables wide with a least depth of 11 fathoms ($20^{m}1$).

Coast.—Between Digos point and the entrance to Tagabuli bay, 2¼ miles northward, foul ground extends from about half a mile to 1¼ miles offshore. The southern entrance point of the bay is covered with mangrove and the entrance is difficult to identify. The bay is about 4 cables wide at the entrance and extends about one mile west-north-westward. The shores and head of the bay are fringed with coral which dries. Anchorage may be obtained by small craft with local knowledge in the middle of Tagabuli bay, protected from all winds except those from east-south-east, in depths of from 16 to 20 fathoms ($29^{m}3$ to $36^{m}6$), mud, where there is a width of about 2 cables between the reefs on either side.

Charts 943, 1263.

Chart 2575.

Santa Cruz point (*Lat. 6° 50′ N., Long. 125° 25′ E.*), 2½ miles north-north-eastward of the northern entrance point of Tagabuli bay, is low and wooded. The coast between these two points is fringed by a reef covered with white coral sand which can be seen from a considerable distance. The village of Santa Cruz is situated on the point of the same name, but it is obscured from seaward by trees.

Vessels with local knowledge usually anchor about 1½ or 2 cables southward of Santa Cruz point, in depths of from 7 to 20 fathoms (12^{m}8 to 36^{m}6). A better protected anchorage may be obtained in a cove about one mile northward of the point, in a depth of 17 or 18 fathoms (31^{m}1 or 32^{m}9), mud, between a reef, which dries about 2 feet (0^{m}6), lying about 4 cables offshore, and the coast. This anchorage is protected from all winds except those from south-eastward.

About 1½ miles northward of Santa Cruz point are two prominent patches of tall grass, lying at an elevation of from 600 to 800 feet (182^{m}9 to 243^{m}8), and half a mile inland; a similar patch lies about 3 miles west-north-westward of the point, at an elevation of from 1,200 to 1,500 feet (365^{m}8 to 457^{m}2); these patches can be seen from a considerable distance.

Mount Apo, about 13 miles north-westward of Santa Cruz point, is 9,690 feet (2,953^{m}5) high, and appears as a peak with steep slopes and rounded summit; a small crater is reported to be in the summit. On the southern side and about 1,000 feet (304^{m}8) below the summit, a part of what was evidently once a crater, appears to have been blown away. There are several fissures from which sulphur steam has been seen issuing. Mount Apo and the surrounding peaks are constantly enveloped in clouds from March to June.

Coast.—Between Santa Cruz point and Malusi point, 3 miles north-eastward, there is a bight, the shores of which are fringed with coral. The land rises steeply to an elevation of 2,500 feet (762^{m}0) within one mile of the shore. The bay is fronted by reefs, parts of which dry, lying within about 6 cables of the shore. Two shoals, with depths of 19 and 28 feet (5^{m}8 and 8^{m}5) over them, lie about half a mile apart, east and west, about three-quarters of a mile southward of Malusi point, the shoaler depth being the outer one. There is a deep channel between these shoals and the point.

About midway between Malusi point and Tagulaya point (*Lat. 6° 55′ N., Long. 125° 29′ E.*), 3¾ miles north-eastward, is Astorga, in the vicinity of which the coast is fringed by mangrove. Between Malusi point and Astorga and for a quarter of a mile on either side of this stretch of coast there is a fringe of coral, but thence to Tagulaya point there is a fine sand beach. In the bay, at the head of which Astorga is situated, there are several detached shoals. All the interior in this vicinity is densely wooded. Tagulaya point is low and wooded, and fringed by a gravel beach.

Off-lying shoals.—About half a mile outside the line joining Malusi and Tagulaya points there is a broken chain of sand and coral shoals, which may generally be discerned, with depths of from 3 feet to 7 fathoms (0^{m}9 to 12^{m}8), extending about 2 miles south-westward from a position about 1½ miles south-south-westward of Tagulaya point.

A shoal, with a depth of 4 fathoms (7^{m}3) over it, lies about 1½ miles north-north-eastward of Tagulaya point, and three-quarters of a mile offshore.

Charts 943, 1263.

Chart 2575.

Coast.—From Tagulaya point to the mouth of Sirawan river, 4 miles northward, the coast is densely wooded and bordered by a sandy beach. Darong, which may be identified by a large green house with a galvanized iron roof, is situated about one mile northward of Tagulaya point, and is visible from a distance of 8 or 10 miles. Sirawan river has a depth of about 6 feet (1^m8) on its bar, but is not navigable for more than half a mile. The village of Sirawan stands on the southern side of the entrance to the river. Daliao, situated at the mouth of the river of the same name, about 1½ miles north-eastward of Sirawan, has a church and is the most important settlement in this vicinity. There is a small pier here, with a depth, in 1937, of 14 feet (4^m3) at its head. Water is laid on to the pier. There is a crane with a lifting capacity of 15 tons. The usual anchorage for vessels with local knowledge is in a depth of from 7 to 10 fathoms (12^m8 to 18^m3), with the pier bearing 283°. There is a mooring buoy in the anchorage.

Off-lying dangers.—Daliao reefs are two coral reefs lying about half a mile south-south-eastward of Daliao and extending about one mile southward. The northern reef dries, and on the northern end of the southern reef there is a rock awash. Between these reefs and the coast there is a deep channel, with a least width of three-quarters of a cable.

There is a detached shoal, with a depth of 28 feet (8^m5) over it, lying about 2 cables northward of the northern of the Daliao reefs and about 3½ cables offshore.

Coast.—Dangers.—Between Dumuy point, situated 2¼ miles north-eastward of Daliao, and Dumalag point, about 2½ miles farther eastward, is Talomo bay, in which there are considerable depths and no dangers. The villages of Lipadas and Dumuy are situated about one and 2 miles, respectively, north-eastward of Daliao, and Matina village stands about 1¼ miles north-north-westward of Dumalag point. The land is low and densely wooded to the water's edge. The coast is bordered by a sandy beach, and there is very little coral.

About one mile westward of Matina village there is a pier with a least depth in 1937 of 13 feet (4^m0) at its head.

Dumalag point (*Lat. 7° 02′ N., Long. 125° 34′ E.*), low and densely wooded, is the southern extremity of Dumalag island, which is separated from the mainland by a narrow passage, only passable by small boats. The point is fringed by coral, which dries, and which extends about one cable southward.

A shoal, with a depth of 31 feet (9^m4) over it, lies about 6 cables south-south-eastward of Dumalag point, and a shoal, with a depth of 4 fathoms (7^m3) over it, lies 3 cables east-south-eastward of the same point.

The coast between Dumalag point and the mouth of Davao river, 3¼ miles north-eastward, is low and swampy, and bordered by a sandy beach. A bank, steep-to at its edge, extends from about one to 4 cables offshore. Davao river has a depth of not more than 2 or 3 feet (0^m6 or 0^m9) on its bar, and the channel frequently changes after freshets. All trade for Davao passes through Santa Ana, about one mile north-eastward.

Pier.—A pier, 100 feet (30^m5) long, with a depth, in 1949, of 27 feet (8^m2) at its head, extends eastward from the settlement at Santa Ana.

Charts 943, 1263.

Chart 2575.

Anchorage.—Anchorage may be obtained by vessels with local knowledge, in a depth of about 12 fathoms (21^{m}9), mud, about 2¼ cables north-eastward or south-eastward of the head of the pier.

Tidal streams.—The tidal streams set parallel with the coast at a maximum rate of about 2 knots, and thus set at right angles to the north and south faces of the pier.

Davao.—Davao, a town of increasing importance, is situated on the north bank of Davao river, close to its mouth. It is the principal shipping port for the south-eastern part of Mindanao ; it is a port of entry, and is open to foreign shipping.

There are three hospitals at Davao.

Communication.—Radio station.—There is regular steamer communication with Japan, Singapore, Australia and other ports in the Philippines.

There is regular communication, by air, with Iloilo.

There is a radio station at Davao. *See* page **14**.

Harbour facilities.—Fresh provisions may be obtained in small quantities. Small repairs to vessels can be effected. There are several hospitals in the town. Water can be obtained alongside the pier. There are two tugs available.

Samal island.—Samal island lies near the head of Davao gulf, and is separated from the coast of Mindanao westward of it by Pakiputan strait. It is wooded and its greatest elevation is near the middle of the eastern side, where it reaches an elevation of 1,700 feet (518^{m}2). It is sparsely inhabited, there being no villages on the east coast and only a few on the west. There are a few small streams on the western side of the island. The eastern coast is steep-to and clear of dangers ; on the western side, near the middle of the island, a fringing reef extends about half a mile offshore, and there are several detached shoals in this vicinity lying within 1½ miles of the same coast. The island is cultivated in parts, principally on the north-eastern side.

Anchorages.—The only good anchorage off Samal is in a depth of from 9 to 12 fathoms (16^{m}5 to 21^{m}9), mud, in the bay on the western side of the island, between Pohun point (*Lat. 7° 04′ N., Long. 125° 41′ E.*), situated about 2¾ miles south-south-eastward of Linao point, the western extremity of the island, and the mouth of Binulin river, 2 miles eastward of Pohun point. The village of Samal, known also as Peñaplata, is situated at the head of the bay.

Malipano anchorage, on the western side of Samal island, about 3½ miles southward of the entrance to the Binulin river, is well protected from the wind and sea by Malipano islet, which lies about a quarter of a mile offshore, and its surrounding rocks and reefs. It is of no commercial importance and is difficult of access, the entrance having a width of only about half a cable between the 3-fathom (5^{m}5) lines on either side, and there are several sunken reefs in the approach. Small vessels with local knowledge anchor in a depth of about 13 fathoms (23^{m}8) mud, with the eastern point of the islet bearing 304°, and the north-western tangent of Talicud island bearing about 224° and just open south-eastward of the small islet close off the southern end of Malipano islet.

Talicud island.—Talicud (Talikud) island, 475 feet (144^{m}8) high, and densely wooded, is separated from the southern end of Samal island on its western side by Talicud (Talikud) strait, a deep channel about

Charts 943, 1263.

Chart 2575.

three-quarters of a mile wide. It is fringed by a coral reef, which, on the northern side, extends about 3½ cables offshore. A 13-foot ($4^{m}0$) patch lies half a mile west-south-westward of the southern extremity of the island, and a 4-fathom ($7^{m}3$) patch lies about 2 cables farther south-westward.

Pakiputan strait.—Dangers.—Pakiputan strait has a least width of about half a mile and is deep in the fairway. The land on the western shore is low and densely wooded, and the shore is bordered by a broad sand flat, which dries and is steep-to.

Some rocky detached shoals lie off the western side of the southern entrance to the strait. The outermost danger is a 5-fathom ($9^{m}1$) patch lying about 1¼ miles east-north-eastward of the head of the pier at Santa Ana, with a 13-foot ($4^{m}0$) patch about 1¼ cables westward of it. A 28-foot ($8^{m}5$) patch lies 1¾ miles north-eastward of the same pier-head and 3¾ cables offshore. Between these outer dangers and the shore there are numerous other shoals with less depths, and in this vicinity the fringing reef dries and extends about 2 cables offshore. Linao point in line with Arboles islet, bearing about 019°, leads eastward of these shoals.

Arboles islet is the summit of a coral reef with a few mangrove trees on it, lying on the eastern side of the fairway near the northern end of the strait. The islet is entirely covered at high water; the reef surrounding it is covered with bright coral sand and shows up well even when there is a depth of 2 or 3 fathoms ($3^{m}7$ or $5^{m}5$) over it. There is a narrow channel, with depths of from 7 to 9 fathoms ($12^{m}8$ to $16^{m}5$) in it between the islet and Samal island. The most dangerous shoal in the northern part of the strait lies about 1½ miles southward of Arboles islet and about 4 cables from the western side of Samal island; it has several heads which dry at the lowest tides. Arboles islet in line with the western side of Bassa point (*Lat. 7° 12′ N., Long. 125° 42′ E.*), the northern extremity of Samal island, bearing about 023°, leads westward of this shoal.

A detached reef, with a depth of 7 feet ($2^{m}1$) over it, lies about 2¼ cables from the western shore and about 1½ miles northward of Lanang point, which is situated 3½ miles north-eastward of the pier at Santa Ana.

Tidal streams.—It was reported, in 1938, that the tidal stream in the strait sets northward with the rising tide and southward with the falling tide at a rate of about 2½ knots; sometimes, however, the stream sets southward with both the rising and the falling tide.

Anchorage.—Directions.—The best anchorage in Pakiputan strait for vessels with local knowledge, with both northerly and southerly winds, is about one mile north-north-eastward of Linao point, where there is a moderate depth close to the narrow fringing reef of Samal island.

To enter Pakiputan strait from southward a vessel should bring Arboles islet nearly in line with Linao point, bearing 019°, and keep on this alignment until within half a mile of the latter; she should then steer along the Samal shore until Arboles islet is in line with Bassa point, bearing about 023°, when she should keep on this alignment until Linao point bears 196°, and then alter course northward to pass half a mile westward of Arboles islet. When Bassa point is abeam, course may be altered as required, the only known off-lying danger northward

Charts 943, 1263.

of the parallel of Bassa point being the shoal northward of Little Cruz island (*see* below).

Cruz islands.—Dangers.—Cruz islands, consisting of Big Cruz and Little Cruz, lie off the north-eastern side of Samal island and are densely wooded. The southern extremity of Big Cruz island is separated from Samal island by a deep channel about three-quarters of a mile wide. Big Cruz island is 90 feet ($27^{m}4$) high at its southern end, where there are mainly cliffs much underworn by the sea. The sides of the island are fringed by a narrow coral reef. Little Cruz island is 42 feet ($12^{m}7$) high near the northern end. On the western side there is a sandy beach. From the northern point a reef, which partly dries, extends about a quarter of a mile northward; the eastern side is fringed by a reef, narrow at the northern end and widening to over three-quarters of a cable at the southern end.

In the channel between the two islands there is a small coral patch which dries, and much broken ground, the greatest depth, which is 21 feet ($6^{m}4$), being close southward of this patch.

About one mile northward of Little Cruz island there is a shoal of coral rocks and sand, with a depth of 2 fathoms ($3^{m}7$) over it, and steep-to, and about a quarter of a mile farther northward there is a 6-fathom ($11^{m}0$) patch.

Coast.—Between the northern entrance of Pakiputan strait and the mouth of Hijo river, at the head of Davao gulf, the coast is generally low and flat and densely wooded to the water's edge. The country inland is an alluvial plain which extends northward as far as the eye can see, forming a wide valley, from 30 to 40 miles wide. Westward, this valley rises to a range which, at the southern end, culminates in Mount Apo, and eastward, to the range along the eastern coast of Mindanao, in which the Agusan river rises.

Several rivers flow out on this coast, but they are of no importance to navigation; the Tuganay and Tagum are the largest. Bunauan river flows out about 6½ miles northward of Lanang point (*Lat. 7° 07′ N., Long. 125° 40′ E.*), and Lasang river, about 2¼ miles north-eastward of the Bunauan. About 5 miles farther north-eastward are the mouths of Tuganay and Tagum rivers. This part of the coast is practically all mangrove, except in the bight northward of the mouth of Lasang river, where, for a distance of 2 miles there are solid banks, from 2 to 5 feet ($0^{m}6$ to $1^{m}5$) high, and with a narrow fringe of sand beach. The land within the beach appears to be drier than elsewhere.

From one mile southward of the mouth of Bunauan river to the broad coral point 2 miles south-westward of the mouth of Tuganay river, a distance of about 6½ miles, the coast is bordered by a mud flat which dries for a distance of from three-quarters of a cable to 3 cables offshore. From this broad coral point to the mouth of Tagum river there is a sand beach, from 1½ to 2¾ cables wide at low water. Midway in the bight between the mouths of Bunauan and Lasang rivers is a coral reef, awash, lying about 1½ cables offshore with mud inshore of it. About half a mile north-eastward of the coral point 2 miles south-westward of the mouth of Tuganay river there is a shoal, which dries, lying about 3½ cables offshore. This is practically the only danger in the vicinity.

Tagum river, the best known and most important river in the gulf, has a depth of 6 feet ($1^{m}8$) on its bar and greater depths inside; it is

Chart 2575.

reported to be navigable for a distance of 10 miles, with a width of about 60 yards ($54^{m}9$). Tuganay river flows out about one cable westward of the Tagum; between them is a broad point which shifts with the channels. Large quantities of driftwood are constantly being brought down. The banks of both rivers are from 2 to 4 feet ($0^{m}6$ to $1^{m}2$) high, generally firm and densely wooded upstream. The outer edges of the bars of both rivers are steep-to. The in-going stream is weak, but the out-going stream attains a rate of from 2 to 4 knots.

Anchorages.—Good anchorage may be obtained by vessels with local knowledge, in depths of from 4 to 5 fathoms ($7^{m}3$ to $9^{m}1$), off the saw mill at Tibungko, a settlement situated on the mainland westward of Bassa point, also in the bight between the mouths of Bunauan and Lasang rivers.

A poor anchorage may be obtained off the bar of Tagum river, in depths of from 15 to 20 fathoms ($27^{m}4$ to $36^{m}6$), mud. It is reported that the bottom in this vicinity is quicksand, and that vessels have lost their anchors here.

From the mouth of Tagum river to Mansaca point, 3¼ miles north-eastward, the coast for the first mile is bordered by a mud flat, which dries; the remainder is a wide sandy beach. Mansaca point is low and densely wooded.

From Mansaca point to the mouth of Madaum river, 2 miles north-eastward and thence 1½ miles eastward to the mouth of Hijo river (*Lat. 7° 21′ N., Long. 125° 51′ E.*), the coast is bordered by a sandy beach. There is a depth of 2 feet ($0^{m}6$) on the bar of the Madaum, and 2 fathoms ($3^{m}7$) inside. On the eastern side of the entrance there is a coral point covered with mangroves. Hijo river is unimportant; a small launch can ascend it a distance of about half a mile.

Anchorage may be obtained, in depths of from 10 to 20 fathoms ($18^{m}3$ to $36^{m}6$), about 6 cables offshore, southward of Tambungon, a settlement situated about 1½ miles north-north-eastward of the mouth of Bunauan river. A prominent wooden building stands at the root of the stone mole which extends southward from the settlement.

EASTERN SIDE OF DAVAO GULF.—Coast.—Danger.—Light.—Cape San Agustin is the southern extremity of the long peninsula which forms the eastern side of Davao gulf. The entire promontory is mountainous; the northern part is cut into by deep valleys, but the southern part, for 5 miles northward from the extremity of the cape, is a continuous range extending along the middle of the long narrow strip which terminates in the cape. These hills decrease gradually in elevation from 1,110 feet ($338^{m}3$), 5 miles northward of the cape, to a rocky bluff, from 15 to 20 feet ($4^{m}6$ to $6^{m}1$) high at its extremity.

A rock, 18 feet ($5^{m}5$) high, fringed by a reef which connects it with the cape, lies about 20 yards ($18^{m}3$) offshore, and is prominent from east or west.

A light is exhibited, at an elevation of 132 feet ($40^{m}2$), from a white framework steel structure, on Cape San Agustin.

About a quarter of a mile south-south-westward of Cape San Agustin is the northern edge of San Agustin reef, over which there is a least depth of 9 feet ($2^{m}7$), and which breaks heavily at times. There is a

Charts 943, 1263.

Chart 2575.

channel one cable wide between the reef and the cape, which may be used by small boats, but it should be used with caution as the tidal streams in the vicinity are strong and irregular.

Current.—Off Cape San Agustin there appears to be a strong constant south-westerly current. In December, 1861, H.M.S. *Sphinx* was set 226°, 42 miles in 16 hours; in February, 1875, H.M.S. *Challenger*, after passing eastward of the Sarangani islands, experienced a set 198°, 38 miles in 24 hours; and in May, 1882, H.M.S. *Lily* experienced a set, 237°, 65 miles in 24 hours.

Coast. — Between Cape San Agustin and Kaganuhan point, 7¾ miles north-north-westward, the hills slope down to the coast; the bluffs and ledges are composed of fossil coral. In this vicinity there are very few sand beaches and the coast is fringed in some places by coral reefs which extend a quarter of a mile offshore.

Talisay and Lima points, situated one mile and 1¾ miles, respectively, northward of Cape San Agustin, are both fairly well defined.

Lavigan anchorage, on the northern side of Lima point, is only a break in the coastal reef, and too small to afford anchorage for any craft larger than a small launch. The shore at its head consists of dense mangroves.

Kanikian point, about 1½ miles northward of Lima point, is low and wooded, and terminates in a cliff, about 15 feet (4^m6) high. It is fringed by a reef which extends about 1½ cables offshore. About 2¼ miles north-north-westward of Kanikian point is Lakga point, on the southern side of which is Pundaguitan anchorage, where there is a prominent sandy beach. The anchorage may be identified by the tall grass on the steep hill side on the northern side of a small valley, in which there are a few native houses.

Tagbanao cove, entered about 2 miles south-eastward of Kaganuhan point, affords a restricted anchorage in the middle to small craft with local knowledge, in depths of 18 or 20 fathoms (32^m9 or 36^m6), mud. Tagbanao point (*Lat. 6° 22′ N., Long. 126° 10′ E.*), the southern entrance point of the cove, is rather high.

Kaganuhan point is well defined from northward and southward on account of six hills that rise in a chain from the extremity of the point which is low and flat; from southward, however, only four hills are visible. There is a large coconut grove on the point. Foul ground extends about 3 cables west-north-westward from the point.

Between Kaganuhan point and Kagan point, 4¼ miles north-north-westward, there are Tagabibi and Abag bays, the former lying on the northern side of Kaganuhan point. The shores of the bays consist of a sandy beach fringed by a narrow reef, and can be safely approached to a distance of a quarter of a mile. There are several large coconut groves on the shore of Abag bay, and the villages of Nazaret and Kalaguhan are situated about half a mile and 3 miles, respectively, south-eastward of Kagan point. There are two prominent iron-roofed houses close together on the beach at Nazaret.

Nangan bay is entered between Kagan point and Batikual point, three-quarters of a mile north-north-westward. Batikual point and the northern shore of the bay are fringed by a reef which extends a quarter of a mile from the point. The shores of the bay are low and wooded. Anchorage, protected from all winds except those between south and west, may be obtained in Nangan bay by vessels

Charts 943, 1263.

Chart 2575.

with local knowledge, in depths of from 22 to 28 fathoms (40^m2 to 51^m2), mud, about 1½ or 2 cables offshore.

Tiblawan is situated at the mouth of the creek of the same name, which flows out about three-quarters of a mile north-westward of Batikual point. It may be identified by a large prominent house with a galvanized iron roof standing in an extensive coconut grove. About 1½ miles farther north-north-westward is Madtuka point, and Luzon village about three-quarters of a mile beyond. Padada point, 2¼ miles northward of Madtuka point, is low and flat, and about one mile farther northward is the village of Magdug.

From Batikual point to Lilisan point, about 2¼ miles northward of Padada point, there is a sandy beach, and the coast is fringed by a narrow reef and fronted by several detached reefs, with depths of from 2 to 5½ fathoms (3^m7 to 10^m1), none of which, however, lies more than one mile offshore. The bluff at Lilisan point is about 100 feet (30^m5) high, steep, and prominent.

Mount Bilbogan, 2,450 feet (746^m8) high, lies about one mile east-south-eastward of Lilisan point. It is a prominent mark for the eastern side of Davao gulf; it is pyramidal in form and from westward appears as a sharp peak, from which, a little below the summit, protrudes a sharp thumb, which is visible a few miles offshore; from northward or southward it shows three small peaks; it is seldom covered by clouds.

Borot cove, entered between Salun point, about 1¼ miles northward of Lilisan point, and Borot point, about 3¾ cables farther northward, may be identified by the steep, rocky bluffs in the approaches on either side. Both entrance points and the head of the cove are fringed with reefs, leaving a contracted anchorage space about 2 cables in width in the northern part of the cove. On Borot point there is a white landslip which is noticeable from southward. Monserat village is situated at the head of the cove; the buildings, with galvanized iron roofs, are prominent from seaward. There is a small concrete pier, with a depth of 13 feet (4^m0) alongside.

Borot reef, awash, lies about half a mile westward of Borot point.

Between Borot point and Bais point (*Lat. 6° 40′ N., Long. 126° 05′ E.*), about 4 miles northward, the coast is bordered by a white sandy beach, fringed by a narrow reef, and fronted by a chain of detached reefs lying from a quarter to half a mile offshore. Sigaboy village, with many iron-roofed houses showing up well among the coconut trees, is situated about half a mile southward of Bais point. It is the most important village on the eastern shore of Davao gulf, and contains a church.

Sigaboy island, 250 feet (76^m2) high, and rocky, with steep cliffs, lies about 4 cables offshore and about 2 miles southward of Bais point. The navigable channel inside it is about 2 cables wide, with a depth of 6½ fathoms (11^m9) in mid-channel. Foul ground extends about one mile northward from the island, and a shoal, with depths of from 4½ to 5 fathoms (8^m2 to 9^m1) over it, lies from about half a mile to 1¼ miles north-westward of the island, and 1¼ miles offshore.

Between Bais point and Limut point, on the northern side of the entrance to Timbo river, about three-quarters of a mile north-eastward, the trees are replaced by tall grass; the entrance to the river is fairly well defined, the beach being higher than at the point.

Charts 943, 1263.

Chart 2575.

Baksal cove lies with its entrance between Limut point and the southern entrance point of Mabua river, 1½ miles north-north-eastward. The latter point is fringed by a narrow reef on which mangroves are growing. Fronting the entrance to the cove there is a chain of detached reefs, the outermost of which, lying about one mile westward of the northern entrance point of the cove, has a depth of about 4 feet (1^{m}2) over it. About a quarter of a mile from the head of the cove there is a rock, awash, and there are several detached reefs in the middle of the cove, with depths of from 1½ to 5 fathoms (2^{m}7 to 9^{m}1) over them.

Between the northern entrance point of Baksal cove and Duas point, about 2 miles northward, the coast is sandy for the first 1¼ miles, and thence to Duas point it is rocky; it is fringed by a reef, which dries, between Mabua river entrance and the entrance to Uañgon creek, half a mile northward, and extends about 1¾ cables offshore. La Union village is situated near the mouth of Uañgon creek. Duas point consists of bare vertical cliffs, from 50 to 100 feet (15^{m}2 to 30^{m}5) high. About half a mile south-eastward of the point there is a hill, 800 feet (243^{m}8) high, on the southern side of which there is a valley separating it from a more prominent hill, 910 feet (277^{m}4) high, situated about 9 cables southward of the point.

Off-lying dangers.—A shoal, with a depth of 22 feet (6^{m}7) over it, lies 3 miles west-north-westward of Limut point.

Burias reef, on which there is a shifting white coral sand cay, 2 feet (0^{m}6) high, lies about 3½ miles west-south-westward of Duas point; the remainder of the reef nearly dries.

A reef, with a depth of 13 feet (4^{m}0) over it, lies about 3 miles westward of Duas point and about half a mile northward of this danger is a group of rocks, which dries, on a reef.

Talisay reef (*Lat. 6° 45′ N., Long. 126° 02′ E.*), which partly dries, and is steep-to, lies about 4 miles north-westward of Duas point and about half a mile north-westward of the group of rocks mentioned above. Foul ground extends about half a mile northward from the drying part of Talisay reef, and a 10-foot (3^{m}0) patch lies about three-quarters of a mile farther northward.

Coast.—Talisay bay lies on the northern side of Duas point and is about 1½ miles wide at its entrance. The shores of the bay are fringed with coral which extends about a quarter of a mile off. The land around the bay is low and swampy, and densely covered with jungle. On the northern side, about 3½ cables inland, there is a prominent hill, 393 feet (119^{m}8) high, covered with tall grass. In the middle of the bay there is a shoal, with a depth of 33 feet (10^{m}1) over it, situated 6 cables north-north-westward of Duas point.

Between the northern entrance point of Talisay bay and Bitaogan point, 1¼ miles northward, the coast is mostly bordered by mangroves, backed by a sandy beach. Midway between these points there is a strip of tall grass which extends inland for nearly 3 miles, and is noticeable for its smooth level appearance, the land on either side being very rough. The extremity of Bitaogan point is low, and usually shows a bar of shingle, which dries about 4 feet (1^{m}2), at the mouth of Bitaogan river, which flows out through the point. Less than half a mile within the point, the land rises to an elevation of 400 feet (121^{m}9). Bitaogan river carries a depth of from 3 to 4 feet (0^{m}9 to 1^{m}2) for a

Charts 943, 1263.

Chart 2575.

distance of about a quarter of a mile and then merges into a shallow mountain stream.

Bato point, 3 miles northward of Bitaogan point, is the abrupt end of a ridge, about 470 feet (143^{m}3) high, extending north-north-eastward for 1¼ miles. The western edge of the ridge slopes steeply to the beach. For a distance of one mile southward of Bato point the coast is fringed by coral which extends about 3½ cables offshore, thence tapering towards the coast about 6½ cables northward of Bitaogan point.

Off-lying dangers.—A shoal, with a depth of 9 feet (2^{m}7) over it, lies about 9 cables north-westward of Bitaogan point, and a 39-foot (11^{m}9) patch lies 1½ miles northward of the same point and about 6½ cables offshore.

A reef, awash, and steep-to, lies about 2¾ miles north-westward of Bitaogan point, and a reef, with a depth of less than 6 feet (1^{m}8) over it, lies about 2¾ miles westward of Bato point.

Coast.—Dangers.—Cuabo bay is entered between Bato point and Sumlug point, about 4 miles north-westward. There are several detached shoals in the middle of the bay, some of which have depths of less than 6 feet (1^{m}8) over them. Cuabo village is situated at the mouth of Cuabo river, which flows out about 2½ miles eastward of Sumlug point. Sumlug point is noticeable on account of a dry sand bar off the mouth of Sumlug river which flows out through the point; there are several native houses standing on the point, which assists in identifying it.

A detached reef, with a depth of 3 feet (0^{m}9) over it, lies 1½ miles westward of Sumlug point, and two other sunken reefs lie about 1¾ miles south-south-westward of the same point.

Between Sumlug point (*Lat. 6° 52′ N., Long. 126° 02′ E.*) and Arena point, 4½ miles north-westward, the coast is low and densely wooded, and bordered by a beach of fine sand. Shoal water extends about half a mile offshore in places between these two points. Lupon river flows out about 1¼ miles south-south-eastward of Arena point. Arena point is low, flat, and densely wooded; it is bordered by a beach of fine sand and is steep-to, having a depth of 10 fathoms (18^{m}3) at a distance of 1¼ cables offshore, but a spit, with depths of less than 3 fathoms (5^{m}5) over it, and steep-to at its edge, extends about half a mile south-south-westward from the point. Lupon village stands close within the coast about midway between Sumlug and Arena points.

Mapanga bay.—Dangers.—Mapanga bay is entered between Arena point and Piso point, 7½ miles north-north-westward. Kabatan, Mapanga, and Piso rivers flow out about 1¾, 3½ and 4 miles, respectively, northward of Arena point. Mapanga river can be entered by a launch at high water. The entrance to Piso river may be identified by a small reef, which dries, near it; it is nearly closed by a bar, and can only be entered by a small boat.

Mount Galintan, 6¼ miles east-north-eastward of Arena point, has a conical peak, 1,710 feet (521^{m}2) high, and, being nearly always free from clouds, is a prominent landmark. Farther inland the mountains are higher.

Piso reef, awash, lies 3 miles southward of Piso point and 1½ miles offshore.

Mapanga reef, which dries about 2 feet (0^{m}6), lies about 1½ miles

Charts 943, 1263.

Chart 2575.

south-south-eastward of the southern extremity of Piso point, and one mile offshore. About 4 cables south-westward of the drying part of the reef there is a shoal, with a depth of 16 feet ($4^{m}9$) over it. There are several reefs in Mapanga bay between the coast and a line joining Piso and Mapanga reefs; they consist of coral and white sand and show up well with a favourable light.

Anchorage.—Anchorage may be obtained by vessels with local knowledge in Mapanga bay, in a depth of about 10 fathoms ($18^{m}3$), mud, westward of the entrance to Maputi creek, and about 3 cables offshore.

Coast.—Dangers.—Piso point rises to an elevation of 775 feet ($236^{m}2$), at a distance of about half a mile within its extremity. Part of the point is rocky, with a fringing reef which extends from a quarter to half a cable offshore, and the remainder is fringed with mangroves, and with a mud bank, which dries, extending about a quarter of a cable offshore.

A shoal, with a depth of 4 fathoms ($7^{m}3$) over it, lies 3½ cables south-westward of the southern extremity of Piso point.

Between Piso point and Pangasinan point, about 5½ miles north-westward, the coast is low and flat, and a densely wooded plain extends several miles inland to the foot of some mountains that rise steeply to peaks about 4,000 feet ($1{,}219^{m}2$) high, but at Piso point the high land extends to the water's edge. The high mountains extending from the head of the gulf are interrupted in the vicinity of Piso point, and a flat country takes its place, which extends eastward to the eastern coast of Mindanao. This valley is broken by hills from 500 to 2,000 feet ($152^{m}4$ to $609^{m}6$) high, but farther northward there are mountains with elevations of from 4,000 to 6,000 feet ($1{,}219^{m}2$ to $1{,}828^{m}8$), and southward the highest peak is Mount Hamiguitan, which has an elevation of 5,343 feet ($1{,}628^{m}6$), situated about 5½ miles eastward of Duas point.

The rivers which discharge between Piso point and Pangasinan point (*Lat. 7° 07′ N., Long. 125° 53′ E.*) are of little value to navigation; the few villages are small and unimportant. Within 2 miles north-westward of Piso point and about one mile offshore there are several detached shoals, with depths of from 2 to 6 fathoms ($3^{m}7$ to $11^{m}0$) over them, and for a distance of about 1½ miles northward of Piso point the coast is fringed by a reef which extends in places 4 cables offshore.

Anchorage may be obtained by vessels with local knowledge about 3 cables northward of Piso point.

Pangasinan point is low, densely wooded, and bordered by a coral and sand beach. A 27-foot ($8^{m}2$) patch lies three-quarters of a mile south-south-westward of the point, and half a mile offshore; a 5-fathom ($9^{m}1$) patch lies three-quarters of a mile north-westward of the point.

Magnaga bay is only a slight indentation in the coast about 2½ miles northward of Pangasinan point; the coast between them is bordered by a sandy beach. The village of Magnaga is situated at the northern end of the bay.

The country around the head of the gulf is very sparsely populated; there are only about six small settlements.

Between Magnaga bay and the mouth of Hijo river, at the head of the gulf, a distance of about 12 miles, there is a low expanse of land along the coast, from a quarter of a mile wide at the northern end to

Charts 943, 1263.

Chart 2575.

3 to 4 miles wide at Magnaga bay. This low land rises steeply to an elevation of nearly 2,000 feet (609^{m}6), eastward of which are ranges with peaks nearly 4,000 feet (1,219^{m}2) high. The land is densely wooded to the water's edge.

For a distance of about 3 miles northward of Magnaga the coast is bordered by a steep-to coral beach, thence for 2 miles it is bordered by mangroves interspersed with coral points, with several deep channels leading into the mangroves. The coastal reef in places extends 3 cables offshore. Gill point, 6 miles north-north-westward of Magnaga, is bordered by a narrow, white coral and gravel beach. From one mile southward of Gill point to abreast of Pandasan island, 2 miles northward of the same point, the coast is solid and steep-to, with a very narrow fringe of beach.

Kopia island, lying one mile northward of Gill point and about 3 cables offshore, is low and well wooded on the outside. The navigable channel between it and Pandasan island, north-eastward of it, is only one cable wide. Kopia village is situated on the eastern side of the island. A spit, with a depth of 9 feet (2^{m}7) over it, extends about three-quarters of a cable from the southern extremity of Kopia island.

A shoal, with a depth of 22 feet (6^{m}7) over it, lies 4¾ cables southward of Kopia island and 3 cables from the mainland.

Pandasan island (*Lat. 7° 17′ N., Long. 125° 50′ E.*), 3¾ cables north-eastward of Kopia island, is separated from the mainland by a channel three-quarters of a cable wide and blocked at its northern end. The island is fringed with coral.

Anchorages.—Good anchorage may be obtained by vessels with local knowledge, sheltered from winds from north-north-west, through north, to east-south-east, southward of Kopia island, clear of the 22-foot (6^{m}7) shoal mentioned above. Small vessels may obtain a good anchorage in mid-channel between Kopia island and the mainland, in depths of from 6 to 9 fathoms (11^{m}0 to 16^{m}5), abreast the middle of the island. This anchorage should be approached from southward as the channel between Kopia and Pandasan island is intricate.

Small craft may obtain good shelter in the channel between Pandasan island and the mainland, in depths of from 3 to 5 fathoms (5^{m}5 to 9^{m}1). In the southern entrance to the channel there are depths of from 10 to 12 feet (3^{m}0 to 3^{m}7), mud.

A fair anchorage, sheltered from winds between north-east and south-east, may be obtained by vessels with local knowledge, in depths of from 12 to 15 fathoms (21^{m}9 to 27^{m}4), mud, about three-quarters of a mile northward of Pandasan island and about 3½ cables offshore.

From abreast Pandasan island, on the eastern side of the gulf, to the mouth of Hijo river, the coast is bordered with mangroves, interspersed by solid beaches. Except for about one mile of muddy shore in the extreme corner of the gulf, this stretch of coast is fringed by coral, which extends from half a cable to 1½ cables offshore.

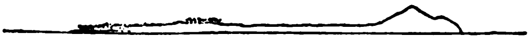
Chart 2193, plan of Palmas island.

PALMAS ISLAND.—Palmas island, situated about 48 miles south-south-eastward of Cape San Agustin, is for the greater part low and covered with coconut palms, the land being only about 5 feet

Charts 943, 1263.

Chart 2193, plan of Palmas island.

($1^{m}5$) high, but in the north-eastern part it rises to Mount Gunong, a conical hill, 363 feet ($110^{m}6$) high, and here the coast is a sheer vertical cliff, 150 feet ($45^{m}7$) high. The island is fringed by a coral reef, which dries in places, extending from about half a cable to 2 cables from the northern and eastern sides. The edge of the reef is very steep-to, except on the south-eastern side. A break in the reef off Miangas village, on the south-western side of the island, is the best and practically the only landing place for small boats. The beach near the village is sloping and consists of sand and coral; there are numerous rocks near the beach.



Palmas island from southward.
(*Original dated* 1931.)

Baronto eilandje, 42 feet ($12^{m}8$) high, and covered with coconut palms, lies on the fringing reef about one cable south-eastward of the southern extremity of Palmas island. Foul ground extends about one cable southward from the islet.

Anchorages.—Current.—The surveying vessel, in 1915, anchored off the break in the reef off Miangas village (*Lat. 5° 33′ N., Long. 126° 35′ E.*), in a depth of 17 fathoms ($31^{m}1$), about one cable from the fringing rocks, laying out an anchor on the reef to prevent dragging off the ledge into greater depths. This anchorage was protected from the heavy north-easterly swell which prevailed at the time, but it is reported that it is difficult to obtain anchorage here.

A better anchorage may be obtained in a small open bay at the south-eastern part of the island, about 3 cables east-north-eastward of the southern extremity, in depths of from 18 to 20 fathoms ($32^{m}9$ to $36^{m}6$), sand, but it is subject to swirls and tide-rips.

A recommended anchorage is with the northern extremity of Baronto eilandje bearing 248°, and the eastern extremity of Palmas island, 023°; this berth is clear of the strong current, but farther out the rate is about 3 knots; when anchored in depths of less than 16 fathoms ($29^{m}3$) the vessel will be clear of the current.

A strong south-going current divides on the bank which extends more than one mile from the northern end of the island causing violent overfalls in that vicinity, and a considerable eddy near the fringing reef southward.

Palmas island is a possession of the Netherlands.

Charts 2575, 943, 1263.

CHAPTER VIII

LUBANG ISLANDS—VERDE ISLAND PASSAGE TO ILOILO BY THE WESTERN AND EASTERN ROUTES—SW. COAST OF LUZON—EAST COAST OF MINDORO—TABLAS, SIBUYAN, AND ADJACENT ISLANDS—PANAY—VISAYAN SEA

Charts 3805, 3806, 3807, 3808.

LUZON.—Luzon, the largest of the Philippines, extends from north to south between the parallels of 18° 40′ and 12° 32′ N. Its coast is much indented in the southern part. Mountain ranges, running generally parallel with the length of the island, give it a mountainous character. Northward of lat. 16° there are two mountain chains, an eastern and a western, separated by the great valley of Cagayan (Kagayan) river. The eastern range, known as the Sierra Madre, is continuous and lofty, and rises steeply from a bold and almost inaccessible coast. There are several isolated volcanic peaks in southern Luzon. The population of the island is about half that of the entire Philippines.

Climate and weather.—*See* page 16.

Chart 3816.

South-western side of Luzon.—Coast.—The coast between Limit point (*Lat. 14° 14′ N., Long. 120° 35′ E.*), the southern entrance point of Manila bay, and Fuego point, about 6 miles southward, is high, rocky and steep-to, with several off-lying islets. It is indented by several small coves, all of which afford anchorage sheltered from all except westerly winds.

The depths off this part of Luzon are considerable, but irregular, and afford little or no warning when approaching the dangers which are steep-to; consequently this coast should be approached with caution.

Companario islet, 110 feet ($33^{m}5$) high, lies about a quarter of a mile westward of Taytayan point, situated about 2 miles southward of Limit point.

Hamilo cove is entered between an islet, 97 feet ($29^{m}6$) high, situated about 2½ miles southward of Limit point, and Hamilo point, about 1¼ miles farther southward. Hamilo point is 360 feet ($109^{m}7$) high, and close westward of it is an island, 120 feet ($36^{m}6$) high. About three-quarters of a mile east-north-eastward of Hamilo point, and about 1½ cables offshore, are some prominent pinnacle rocks, 30 feet ($9^{m}1$) high.

Charts 943, 2661b, 1263.

Chart 3816.

In the eastern part of the cove there is a basin, about a quarter of a mile wide at the entrance; the head of this basin is fringed with mangroves. A well protected anchorage may be obtained by vessels with local knowledge in the northern part of the basin, in depths of from 6 to 8 fathoms ($11^{m}0$ to $14^{m}6$), mud.

Between Hamilo point and Fuego point there are three bays, the middle of which is known as Looc (Look) cove. It is about three-quarters of a mile wide, and the shores are steep-to except towards the head, where the depths decrease gradually to a sand beach bordered by trees. Fuego point is 70 feet ($21^{m}3$) high at its extremity, and close northward of it are two small islets, the outer of which is 93 feet ($28^{m}3$) high. About one mile northward of Fuego point is an islet, 90 feet ($27^{m}4$) high, between which and the southern entrance point of Looc cove, three-quarters of a mile east-south-eastward, are some shoals.

Nasugbu bay. — Dangers. — Light. — Nasugbu bay is entered between Fuego point and San Diego point, 6¾ miles south-south-eastward. Between Fuego point and Nasugbu point, about 3¾ miles south-eastward, the shore is high and wooded, thence to San Diego point it is low and wooded, with a dark sandy, steep-to beach. Wawa river flows out on the eastern side of Nasugbu point and Liang (Lian) river about 1½ miles farther southward; both of these rivers have a depth of less than 2 feet ($0^{m}6$) on their bars.

The town of Nasugbu is situated midway between the mouths of these rivers and about a quarter of a mile inland. There is occasional steamer communication with Manila. There is a pier, which had, in 38, a depth of 21 feet ($6^{m}4$) alongside.

About 1¼ miles south-south-eastward of Fuego point are two islets, 35 feet ($10^{m}7$) high and covered with grass; they are connected by a reef, over which there is a depth of 2 feet ($0^{m}6$). About 3 cables north-eastward of the north-western islet and about 6 cables offshore are some rocks awash.

Pillar rock (*Lat. 14° 05′ N., Long. 120° 37′ E.*), 25 feet ($7^{m}6$) high, lies about half a cable westward of Nasugbu point, and about a quarter of a mile north-westward of the rock is a rock awash. A rocky shoal, with a depth of less than 6 feet ($1^{m}8$) over it, lies about 4 cables south-westward of the southern extremity of Nasugbu point.

A light is exhibited, at an elevation of 36 feet ($11^{m}0$), from a white concrete pillar, on the southern side of the entrance to Wawa river.

Anchorage. — Good anchorage, protected during the North-east monsoon, may be obtained by vessels with local knowledge, about 6 cables southward of Nasugbu point, in depths of from 6 to 7 fathoms ($11^{m}0$ to $12^{m}8$), about half a mile offshore.

Off-lying island and dangers.—Light.—Fortune island, 390 feet ($118^{m}9$) high, lies 7½ miles west-south-westward of Nasugbu point; it is partially wooded and steep-to.

A light is exhibited, at an elevation of 415 feet ($126^{m}5$), from a white concrete pillar on Fortune island.

Simo banks consist of four banks lying from 8 to 18 miles westward of Fuego point. There is a least depth of 6 fathoms ($11^{m}0$) on the western bank, and 40 feet ($12^{m}2$) on the bank next eastward. For about 5 miles eastward of the eastern bank the depths are irregular.

Coast.—Light.—Talin bay, entered between San Diego point and

Charts 3806, 943, 2661b, 1263.

Chart 3816.

Talin point, 3½ miles southward, is encumbered with shoals, and open to the north-westward; its shores consist of alternate rocky cliffs and sandy beaches. Talin point, rising to an elevation of about 280 feet (85^{m}3), about one mile south-eastward of its extremity, is fringed by a reef which extends about one cable offshore. A spit, with a depth of 3 fathoms (5^{m}5) over its outer end, extends half a mile north-north-westward from the point.

The coast between Talin point and Calatagan (Kalatagan) point, about 10 miles southward, is fringed by a reef, which, northward of the latter point, extends one mile offshore and dries. There are numerous shoals, with depths of from 9 to 42 feet (2^{m}7 to 12^{m}8) over them, lying from half a mile to about 2½ miles offshore in this area. Northward of Calatagan point the coast is low and sandy and covered with mangroves; it is indented by several estuaries. Between Calatagan point and Cape Santiago, about 3½ miles south-eastward, the land is higher and the coastal reef is steep-to and extends only a short distance offshore.

Cape Santiago, the south-western extremity of Luzon, rises to an elevation of 380 feet (115^{m}8) about 1¼ miles inland; it is wooded, and fringed by a reef, which dries, extending about one cable offshore. At the edge of the reef there are depths of 4 and 5 fathoms (7^{m}3 and 9^{m}1), increasing steeply to over 50 fathoms (91^{m}4) about half a mile offshore.

A light is exhibited, at an elevation of 89 feet (27^{m}1), from a white circular tower and dwelling, about 4 cables north-westward of the southern extremity of Cape Santiago. *See* view facing page 38.

LUBANG ISLANDS.—Lubang islands are a group of six islands which front the south-western end of Luzon and the north-western end of Mindoro. The only safe anchorage for vessels during all seasons is at Port Tilig, on the northern side of Lubang island.

Cabra island.—Light.—Cabra island, the westernmost of the group, is flat-topped, wooded, and about 200 feet (61^{m}0) high. A reef extends about half a cable from the northern and north-eastern sides.

A light (*Lat. 13° 53′ N., Long. 120° 01′ E.*) is exhibited, at an elevation of 216 feet (65^{m}8), from a white square brick tower on a white dwelling, at the western extremity of Cabra island.

The channel between Cabra island and Lubang island is 1½ miles wide and deep in the fairway. The reef fringing the north-western end of Lubang island is always visible, and the south-eastern side of Cabra island is steep-to.

Lubang island.—Lubang island, the largest and most important of the group, attains an elevation of 1,967 feet (599^{m}5) near the middle of the south-western side, but is low at either end. When approaching from southward, the north-western extremity of the high land in the middle may be mistaken for the end of the island. Its coasts are fringed by a reef which extends about a quarter of a mile offshore in places; the south-western side is rocky. On the north-eastern and eastern sides are several bays, more or less protected, but difficult to enter on account of the shoals and reefs by which they are encumbered.

Lubang, the principal town, is situated on the northern side of

Charts 3806, 3807, 943, 2661b, 1263.

the island, about 2 miles from the north-western extremity. It stands on the edge of a fertile plain, and contains a prominent church. Landing is difficult in front of the town on account of the coral reef which fringes the coast. There is a break in the fringing reef westward of the church, through which small boats can pass in fine weather at certain stages of the tide. There is no good anchorage off the town. Vessels wishing to communicate with Lubang should steer for the church, bearing 166°, until the south-western extremity of Ambil island is in line with the first point eastward of Port Tilig, bearing about 122°, about 1½ miles offshore.

Port Tilig, entered about 5 miles south-eastward of Lubang, is sheltered from all winds and is completely protected from the sea; the holding ground is good, but the anchorage is only available for small vessels with local knowledge. The entrance, in which there are depths of from 10 to 14 fathoms ($18^{m}3$ to $25^{m}6$) in mid-channel, is open north-north-westward, and lies between reefs on either side. The western shore can be approached until the anchorage in front of the entrance point is reached, where there are depths of from 3½ to 5 fathoms ($6^{m}4$ to $9^{m}1$), mud and sand. A shoal, which dries, divides the port into two small but good anchorages.

Tilig settlement, on the western side of the port, is of some importance as most of the trade of the group passes through it. A pier was under construction in 1938. A few provisions may be obtained.

Off-lying danger.—Afuera shoal, with a least depth of 7 feet ($2^{m}1$) over it, lies about 2½ miles northward of the western entrance point of Port Tilig. The northern extremity of Ambil island in line with the southern extremity of Mandaui island (*Lat. 13° 50′ N., Long. 120° 20′ E.*), bearing 097°, leads southward of the shoal.

Looc bay.—Dangers.—Looc (Look bay) is entered between Tumbaga point, situated about 7 miles south-eastward of Port Tilig, and Pauican (Pauikan) point, about 1½ miles southward of Tumbaga point. It affords a safe anchorage to vessels with local knowledge, being somewhat protected near the head of the bay from easterly winds by the reefs in the middle. A bank, with a depth of 27 feet ($8^{m}2$) over its outer end, extends a quarter of a mile south-eastward from Tumbaga point. Talinas islet lies close eastward of Pauican point, and a bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends about 6 cables northward from the point. There is good holding ground just inside the entrance, in depths of from 10 to 20 fathoms ($18^{m}3$ to $36^{m}6$). Farther in the depths decrease suddenly and several coral reefs encumber the bay and prevent direct access to the head. Good shelter, however, may be obtained between these reefs. Looc (Look) village is situated at the head of the bay.

Off-lying dangers.—A shoal, with a depth of 21 feet ($6^{m}4$) over it, lies about 3¾ miles eastward of Pauican point, and a 7-fathom ($12^{m}8$) patch about midway between them.

Anchorages.—Vessels with local knowledge may obtain a sheltered anchorage in heavy north-easterly weather in Tabajin (Tabahin) bay on the southern side of Lubang island, about 2½ miles north-westward of Manog point, the southern extremity of the island. Landing may be effected on a sandy beach at the head of the bay. A 27-foot ($8^{m}2$) patch lies in the north-western part of the bay, about half a mile offshore.

Charts 3807, 943, 2661b, 1263.

Chart 3816.

A good sheltered anchorage during the North-east monsoon may be obtained by vessels with local knowledge in Tagbac (Tagbak) cove, at the north-western end of Lubang island, on the south-western side, in a depth of 15 fathoms (27m4), in a break in the reefs. The land in the vicinity is low and there are no prominent landmarks, but no difficulty will be found in picking up an anchorage.

Islands and dangers north-eastward of Lubang island.—Ambil island, separated from the north-eastern side of Lubang island by a channel about one mile wide, is formed by a conical mountain 2,477 feet (755m0) high. The north-eastern side of the island is high and rocky, with an open bay, in which there are depths of from 10 to 12 fathoms (18m3 to 21m9), shoaling to 5 fathoms (9m1) near the fringing reef. The western side of the island is fringed with coral. The anchorage space in the bay on the southern side of the western point is considerably reduced by reefs which extend 3 cables offshore. A 15-foot (4m6) patch lies nearly in the middle of this bay, leaving little room for anchorage.

The channel between Ambil and Lubang islands is clear of dangers in the fairway, but the fringing reefs on either side contract the channel to a width of 6½ cables.

A shoal, with a depth of 40 feet (12m2) over it, lies about 1¼ miles west-south-westward of Antucao (Antukao) point, the southern extremity of Ambil island.

Irregular depths extend from the north-western side of Ambil island. Ambil shoal, with a least depth of 21 feet (6m4) over it, lies about 1½ miles northward of the western extremity of the island, and two 22-foot (6m7) patches lie about half a mile west-north-westward and northward of the same point. Vessels with a draught of over 18 feet (5m5) should not attempt to pass between Ambil shoal and Ambil island.

A bank, with depths of from 28 to 48 feet (8m5 to 14m6), lies from about 2½ to 4½ miles northward of the northern extremity of Ambil island.

Mandaui island (*Lat. 13° 50′ N., Long. 120° 20′ E.*), 275 feet (83m8) high, lies 6½ cables north-eastward of Ambil island. The north-eastern side is steep-to, and a reef extends about one cable from the south-western side, with depths of less than 3 fathoms (5m5) about 1½ cables farther. The channel between Mandaui and Ambil islands is 3 cables wide, with a least depth of 31 feet (9m4) in the fairway.

Malavatuan island, 248 feet (75m6) high, and covered with brushwood, lies 1½ miles north-north-eastward of Mandaui island, with a deep passage between. A bank, with a depth of 6 fathoms (11m0) over its outer end, extends half a mile north-westward from Malavatuan island and a 37-foot (11m3) patch lies nearly one mile north-westward. Two banks, each with a least depth of 7 fathoms (12m8) over it, lie about 1¾ miles east-north-eastward and 3¾ miles north-north-eastward, respectively, of the same island.

Golo island.—**Light.**—Golo island, 958 feet (292m0) high, is separated from the south-eastern extremity of Lubang island by Golo pass, about half a mile wide, but the channel is encumbered in the middle by some rocks, nearly awash. H.M.S. *Teazer*, in 1872, anchored in a depth of 13 fathoms (23m8), mud, off the south-western side of

Charts 3806, 3807, 943, 2661b, 1263.

Chart 3816.

Golo island, with Cape Calavite, the north-western point of Mindoro, bearing 189°, and the south-western side of Golo island, 115°. About a quarter of a cable nearer the shore, depths of 4 and 5 fathoms ($7^{m}3$ and $9^{m}1$), coral, were obtained.

A light is exhibited, at an elevation of 186 feet ($56^{m}7$), from a concrete tower, on the south-eastern extremity of Golo island.

VERDE ISLAND PASSAGE.—Verde Island passage lies between the south-western side of Luzon and the northern side of Mindoro. Verde island divides the passage into two channels, named North and South passes, either of which may be taken.

Current.—*See* page 10.

Northern side of Verde Island passage.—Balayan bay.—Lights.—Dangers.—Balayan bay, entered between Cape Santiago and Bagalangit (Benagalet) point, 13 miles east-south-eastward, has considerable depths with a mud and sand bottom and it is clear of dangers. The shores are so steep-to that a vessel must approach very close to get within a depth of 12 fathoms ($21^{m}9$). The tidal streams set northward and southward.

Pagapas bay lies on the western side of Balayan bay and has considerable depths. The shore is fringed by a narrow reef which is steep-to. There are two small openings in the reef at the head of this bay, each about 1¼ cables wide, where small craft with local knowledge may obtain a sheltered anchorage. San Pedrino point, the northern extremity of Pagapas bay, is 744 feet ($226^{m}8$) high, about a quarter of a mile within its extremity, and is well wooded. It is fringed by a reef which extends half a cable offshore.

A pier, with a depth, in 1938, of 6 feet ($1^{m}8$) at its head, extends south-eastward across the reef northward of the mouth of Santiago river at the head of the bay. A prominent warehouse is situated at the root of the pier.

The town of Balayan (*Lat. 13° 56′ N., Long. 120° 44′ E.*) is situated on the northern shore of Balayan bay at the mouth of a small river, the bar of which dries about one foot ($0^{m}3$). The town is connected to the general telegraph system. A coral reef extends about a quarter of a mile offshore in front of the town, with a rock, which is awash, near its outer end, and Carabao rock, with a depth of about 2 feet ($0^{m}6$) over it, about half a cable south-eastward of it.

A light is exhibited, at an elevation of 36 feet ($11^{m}0$), from a white framework structure, at Balayan.

Lemery (Lemeri) and Taal are towns situated on the western and eastern banks, respectively, of Pansipit river, which flows out on the eastern shore of Balayan bay about 10 miles northward of Bagalangit point. This river, which connects Balayan bay with Taal lake, 3¾ miles north-eastward, has a depth of 7 feet ($2^{m}1$) on its bar at high water. Taal is connected to the general telegraph system. The church at Taal stands on a hill behind the town and is an excellent mark ; the church at Lemery has twin metal-domed towers.

A light is exhibited, at an elevation of 29 feet ($8^{m}8$), from a white concrete column, at Lemery.

Bagalangit point, the western extremity of Calumpan (Kalumpan) peninsula, is a rocky bluff, 440 feet ($134^{m}1$) high, fringed by a narrow reef which extends along the south-western part of the peninsula nearly

Charts 3807, 943, 2661b, 1263.

Chart 3816.

to Cazador point, the southern extremity. This part of the coast is clear of dangers and steep-to at the edge of the narrow reef.

Anchorages.—Anchorage may be obtained by vessels with local knowledge, in a depth of about 15 fathoms ($27^{m}4$), south-eastward of the reef off the mouth of Santiago river.

The usual anchorage for large vessels off Balayan is in a depth of from 10 to 12 fathoms ($18^{m}3$ to $21^{m}9$), about 3 cables offshore, with the light-structure bearing 329° and the dome of the church, situated 6 cables westward of the light-structure, 295°. Small vessels with a draught not exceeding 10 feet ($3^{m}0$) may obtain anchorage off the eastern end of the reef, in depths of from 5 to 7 fathoms ($9^{m}1$ to $12^{m}8$), with the light-structure bearing 329°, distant about 3½ cables.

The usual anchorage for large vessels off Lemery and Taal is about 3¾ cables westward of the light-structure, in a depth of 15 or 16 fathoms ($27^{m}4$ or $29^{m}3$). Small vessels may obtain anchorage according to draught anywhere off the town of Lemery.

Maricaban island.—Dangers.—Maricaban (Marikaban) island lies 1¼ miles southward of Cazador point, and is separated from it by Maricaban (Marikaban) strait. Near the eastern end of the island is Mount Casapao (Kasapao), 1,468 feet ($447^{m}4$) high, bare of trees and covered with tall grass. Near the western end is a peak, 1,005 feet ($306^{m}3$) high. The coast is bordered by rocks, and two rocky islets, Caban (Kaban) and Sombrero, lie off the north-western end and two others, Culebra and Malajibomanoc (Malahibomanok), off the eastern end.

Caban islet is 285 feet ($86^{m}9$) high, and sparsely covered with trees and bushes. Sombrero islet, about 6 cables northward of Sepoc (Sepok) point, the north-western extremity of Maricaban island, is surrounded by a coral reef with some rocks above water and others awash. The islet is 142 feet ($43^{m}3$) high, covered with low bushes, and is very prominent.

Sepoc point (*Lat. 13° 41′ N., Long. 120° 50′ E.*) is a steep rocky headland, 120 feet ($36^{m}6$) high; from a distance it appears to be an island, being connected with the main body of the island by a rocky isthmus, about 5 feet ($1^{m}5$) high.

A shoal, with a least depth of 5 feet ($1^{m}5$) over it, lies about one mile south-westward of Sepoc point; between them there is a deep channel about three-quarters of a mile wide.

A shoal, with a depth of 2 fathoms ($3^{m}7$) over it, lies about a quarter of a mile northward of the northern extremity of Caban island. A reef with some rocky heads awash and steep-to, lies about 1½ cables northward of the middle of the northern side of Maricaban island, and southward of Cazador point.

Culebra islet, 95 feet ($29^{m}0$) high to the tops of the trees, lies about 3 cables from the eastern end of Maricaban island. Its sides are rocky except the northern extremity, which is coral sand. The channel between Culebra islet and Maricaban island is about one cable wide, with a depth of 6 fathoms ($11^{m}0$) in the fairway.

Malajibomanoc islet, about three-quarters of a mile eastward of Culebra islet, is low and covered with trees, the tops of which are about 35 feet ($10^{m}7$) high. Shoal water extends from either side of the channel between the two islets, leaving a deep passage about 2 cables wide.

Charts 3807, 943, 2661b, 1263.

Chart 3816.

Port Maricaban (Marikaban) is formed by the narrow strait between Maricaban and Caban islands, and can be entered from either end, but the passage from northward is preferable. Small vessels sometimes take refuge here, anchoring off Maricaban (Marikaban) village and secure to the shore and to each other.

Maricaban strait.—Maricaban strait has considerable depths and is clear of dangers in the fairway; the tidal streams in the strait are strong.

Cazador point is formed by a tongue of land, about 150 feet ($45^{m}7$) high, and covered with trees. Off the point, and joined to it, are some rocks, and a reef, which is steep-to, extends about one cable from its eastern side.

Batangas bay.—Batangas bay, entered between Cazador point and Matoco (Matoko) point, about 9 miles east-south-eastward, is deep, clear of dangers, and its shores are steep. The western shore between Cazador point and the entrance to Mainaga cove, about 5¾ miles north-eastward, is rocky and wooded, and can be safely passed at a distance of half a mile.

Bauan, a small town at the head of Batangas bay, is situated about half a mile inland, and may be identified by a prominent white church with a dome. It is connected by railway with Manila.

Matoco point is high, wooded and precipitous. Between this point and Naboled point, about 1¾ miles north-north-eastward, the coast is fringed with rocks and a narrow, steep-to coral reef; there are depths of 5 fathoms ($9^{m}1$) close off the reef, and off Matoco point there are depths of 100 fathoms ($182^{m}9$) about 4 cables offshore. Between Naboled point and the mouth of Calumpan (Kalumpang) river, 4½ miles northward, the coast is bordered with sand and gravel. Between Pinamucan (Pinamukan) point, about 2 miles northward of Naboled point, and Cota (Kota) village, situated southward of Bauan, there are sand beaches.

Anchorages.—Small vessels with local knowledge may obtain a sheltered anchorage in strong south-westerly winds in Mainaga cove, in depths of from 10 to 16 fathoms ($18^{m}3$ to $29^{m}3$), mud, but care must be taken to avoid a rock, with a depth of less than 6 feet ($1^{m}8$) over it, about 3 cables north-eastward of the southern entrance point. There is a stone mole at the head of the cove. A shoal, with a depth of about one foot ($0^{m}3$) over it, southward of Biluga point (*Lat. 13° 46′ N., Long. 120° 57′ E.*), on the northern side of the entrance, is usually marked by stakes.

Small craft with local knowledge may obtain anchorage within 2 cables of the northern shore of Batangas bay between Cota village and the pier at Santa Clara, about 2½ miles south-eastward, in depths of from 12 to 14 fathoms ($21^{m}9$ to $25^{m}6$), with good holding ground.

Chart 3559, plan of Batangas.

Batangas. — Light. — Anchorage. — Batangas, the principal town in the bay, is situated on the western bank of Calumpan river, about three-quarters of a mile inland, eastward of Santa Clara.

There is a concrete pier at Santa Clara, which had, in 1938, depths of from 17 to 20 feet ($5^{m}2$ to $6^{m}1$) at the outer end. Water is laid on to the pier. In 1947, two ocean-going vessels could be accommodated alongside the pier.

Charts 3807, 943, 2661b, 1263.

Chart 3559, plan of Batangas.

A light is exhibited, at an elevation of 30 feet ($9^{m}1$), from a white framework structure, at the root of the pier at Santa Clara.

Large vessels may obtain good anchorage south-westward of the pier at Santa Clara, in depths of from 15 to 18 fathoms ($27^{m}4$ to $32^{m}9$). The bar of Calumpan river is about 1½ cables wide and very shallow.

There is a hospital at Batangas.

Communication.—Radio station.—Batangas is connected to the general telegraph system, and by railway with Manila.

There is a radio station at Batangas, *see* page 14.

Chart 3816.

Southern side of Verde Island passage.—Coast.—Cape Calavite and the coast southward of it have been described on page 38.

Itbu point, 2 miles north-north-eastward of Cape Calavite, resembles it in appearance and is steep-to, the few rocks interspersed along this part of the coast lying close in. Southward of the point there is a small bight with a sandy beach, off which anchorage may be obtained by vessels with local knowledge during the North-east monsoon, in a depth of 5½ fathoms ($10^{m}1$), sand, 1½ cables from the beach. There is another anchorage close northward of Cape Calavite, but it is not so good.

Del Monte point (*Lat. 13° 32′ N., Long. 120° 25′ E.*), 6¾ miles north-eastward of Itbu point, is sandy. Bagalayag point, about 9 miles eastward of Del Monte point, is a rocky bluff, 35 feet ($10^{m}7$) high; thence to Bogio point, 9 miles farther eastward, the coast is steep-to, especially between Baeto point, situated 5½ miles eastward of Bagalayag point, and Bogio point, where it is almost precipitous. Between Bagalayag and Bogio points the coast is backed by mountains from about 2,000 to 3,500 feet ($609^{m}6$ to $1,066^{m}8$) high, and densely wooded.

Between Bogio point (*Lat. 13° 29′ N., Long. 120° 42′ E.*) and a point about 3½ miles eastward the coast is bordered by a wide sandy beach, and the Cervantes and Matabang rivers flow out. From here the low land extends a considerable distance inland. At Bogio point the eastern slope of a mountain, situated about 2½ miles south-westward of it, up to an elevation of 2,000 feet ($609^{m}6$), is covered with greenish-yellow grass.

The Cervantes and Matabang are probably mouths of the same river running out of the gap between two high ranges of mountains. Only small boats can enter their mouths. A bank, with a depth of 3 fathoms ($5^{m}5$) over its outer edge, and steep-to, extends 1¼ cables from the entrance to these rivers. Anchorage may be obtained in the bight off the mouths of the rivers, known as Ilog anchorage, but the berth is necessarily close to the edge of the coastal bank.

Eastward of the mouths of Cervantes and Matabang rivers, as far as the mouth of Camerong (Kamerong) river, about 7½ miles from Bogio point, there are numerous hills, partially wooded, rising abruptly from a rocky coast, to elevations of 300 or 400 feet ($91^{m}4$ to $121^{m}9$), and separated by sandy beaches; farther inland there is a higher range which approaches the coast eastward; it is generally covered with clouds except in the early morning. Mount Talipanan, of this range, is 4,030 feet ($1,228^{m}3$) high, and has a sharp prominent peak.

Between the mouth of Camerong river and Talipanan point, about 2¾ miles east-north-eastward, the coast is bold and almost precipitous, especially at the point; thence to Minolo point, 1½ miles farther, it is

Charts 3807, 943, 2661b, 1263.

Chart 3816.

mostly a sandy beach. Minolo point is covered with trees, and on its eastern side is a beach, off which anchorage may be obtained over a sand and gravel bottom. There are some hills here, from 200 to 300 feet ($61^{m}0$ to $91^{m}4$) high, rising abruptly from the steep rocky coast, interspersed with sandy beaches; about 3 cables offshore there are depths of from 25 to 30 fathoms ($45^{m}7$ to $54^{m}9$). About half a mile eastward of Minolo point is a cove fringed by reefs which contract the anchorage area to about 1½ cables in diameter. A depth of 6 fathoms ($11^{m}0$) can be carried through the fairway of the entrance, and inside there are depths of from 8 to 12 fathoms ($14^{m}6$ to $21^{m}9$). The cove does not appear to afford a good anchorage.

Chart 3559, plan of Port Galera and Varadero bay.

Port Galera.—Dangers.—Port Galera is formed by a promontory projecting from the northern side of Mindoro and the islands of Medio and Paniquian. There are two passages into the port, North-west channel and North channel, on the south-western and eastern sides, respectively, of Medio island; the entrance southward of Paniquian island is closed by a sand bar.

The tidal stream which enters North-west channel flows out through North channel and thence sets eastward, the reverse taking place with the west-going stream in Verde Island passage.

Paniquian island, 200 feet ($61^{m}0$) high and wooded, is fringed by a reef except for a short distance on its northern and western sides; the southern end of the island terminates in a sandy point which is now joined to Mindoro. A bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends three-quarters of a cable offshore in places. Two sunken rocks lie near the outer end of a spit extending about 3 cables northward from the point situated about 4 cables southward of the western extremity of the island.

Medio island, 265 feet ($80^{m}8$) high and wooded, is fringed by a reef which extends about 1½ cables from its north-eastern side, and depths of less than 3 fathoms ($5^{m}5$) extend about half a cable farther. A shoal, with a depth of 9 feet ($2^{m}7$) over it, lies about one cable westward of North point (*Lat. 13° 32′ N., Long. 120° 57′ E.*), the northern extremity of the island. A bank, with depths of 3 fathoms ($5^{m}5$) over it, or less, extends up to a distance of about one cable from the north-western side of the island. There is a tide race off the bare rocky North point.

Telegraph point, the north-western point of the promontory extending from the northern side of Mindoro, mentioned above, may be identified by a prominent white patch like a sail on the side of the point. From here to Escarceo point (chart 3816), the eastern extremity of the promontory, the coast has a uniform appearance.

A bank, with a depth of 3 fathoms ($5^{m}5$) over it, or less, extends about 1½ cables from the northern side of the promontory, and a detached shoal, with a depth of 9 feet ($2^{m}7$) over it, lies about 3½ cables north-north-eastward of Telegraph point.

Leading beacons.—Light.—A light is exhibited, at an elevation of 60 feet ($18^{m}3$), from a white triangular-shaped beacon with a black vertical stripe, on the bluff on the promontory situated about 2½ cables south-eastward of the southern extremity of Medio island. A similar beacon stands south-eastward of the light beacon. The two beacons in line, bear 125°.

Charts 3807, 943, 2661b, 1263.

Chart 3559, plan of Port Galera and Varadero bay.

For light at Puerto Galera, *see* page 315.

Channels.—Danger.—North-west channel, between Medio and Paniquian islands, is narrowed at the entrance to a width of 130 yards ($118^{m}9$) between the banks extending from either side, but it widens inside to about 1½ cables. A rock, 62 feet ($18^{m}9$) high, lies on the edge of the reef fringing the south-western side of Medio island.

North channel has a least width of three-quarters of a cable between the 3-fathom ($5^{m}5$) lines on either side, and a least depth of 31 feet ($9^{m}4$) in the fairway. The eastern side of Medio island is low and bordered by a narrow sandbank. A shoal, with a least depth of less than 6 feet ($1^{m}8$) over it, lies in the middle of the southern entrance to North channel. The channel on either side of this shoal is about half a cable wide.

Dangers.—A spit, with depths of from one to 4 feet ($0^{m}3$ to $1^{m}2$) over it, extends about 2½ cables northward from a point on the southern side of the port situated about 4½ cables south-westward of the leading beacons. Another spit, with a least depth of one foot ($0^{m}3$) over it, near its outer end, extends about 2 cables north-westward from the same point. Two shoals with depths of 33 and 21 feet ($10^{m}1$ and $6^{m}4$) over them, lie about 3 and 4 cables, respectively, northward of this point. A reef extends about 1½ cables westward from the eastern side of the port close southward of the leading beacons.

Anchorages.—Directions.—The principal anchorage is in a depth of about 12 fathoms ($21^{m}9$), eastward of Paniquian island. The available space is considerably reduced by shoals extending from all sides. Small craft may obtain anchorage in a confined bight in the southern part of the port, in a depth of about 6 fathoms ($11^{m}0$), northward of the town of Puerto Galera, or in the space about 2 cables wide, eastward of the southern extremity of Paniquian island (*Lat. 13° 31′ N., Long. 120° 57′ E.*), in a depth of about 9 fathoms ($16^{m}5$).

A vessel entering by North-west channel should keep the leading beacons bearing 125° until abreast of the north-eastern point of Paniquian island, when she should alter course southward for the middle of the port.

During the North-east monsoon North channel may be used by keeping in the middle. The anchorage at Varadero bay is preferable at this season.

Chart 3816.

Small vessels may obtain anchorage, in a depth of 16 fathoms ($29^{m}3$), protected from winds of both monsoons, in Balateros cove, situated on the northern coast of Mindoro south-westward of the western extremity of Paniquian island. The cove is formed between two coral reefs and two high wooded points.

South pass.—Light.—South pass lies between the southern side of Verde island and the northern side of Mindoro.

Verde island has two prominent peaks, the higher and northern of which has an elevation of 1,311 feet ($399^{m}6$), and is well wooded. Rocks, which dry, lie about one cable south-eastward of the eastern extremity of the island. On the northern side of the island there is a bight where vessels with local knowledge may obtain shelter during southerly winds, in depths of from 7 to 10 fathoms ($12^{m}8$ to $18^{m}3$) close offshore ; the coast here is high and wooded, with occasional sand beaches.

Charts 3807, 943, 2661b, 1263.

Chart 3816.

Escarceo point, so named from the tide-rips off it, is rocky and covered with trees. The coast between this point and Boaya point, about 2 miles south-westward, is steep-to and clear of dangers. The tidal streams here run at a considerable rate, and cause strong eddies.

A light is exhibited, at an elevation of 136 feet ($41^{m}4$), from a white concrete house, on Escarceo point.

Chart 3559, plan of Port Galera and Varadero bay.

Varadero bay.—Light.—Varadero bay, entered between Boaya point and Varadero point, 5½ cables south-westward, affords good anchorage for all classes of vessels in both monsoons, especially during the south-west season, when the heavy squalls pass northward of it. It is reported to be preferable to Port Galera, especially in bad weather.

Boaya point is clear of dangers, but from Varadero point, rocks, some of which dry, extend about 1¼ cables northward. A spit, with a least depth of 9 feet ($2^{m}7$) over it, extends about 2 cables southward from the northern shore.

A light is exhibited, at an elevation of 85 feet ($25^{m}9$), from a white concrete column, on a hill at Puerto Galera at the head of Varadero bay.

Anchorages.—The best anchorage for large vessels is in a depth of 10 fathoms ($18^{m}3$), with the light-structure bearing 315°. During fresh north-easterly weather the wind sometimes veers well eastward, and considerable sea is felt at this anchorage. Small vessels may obtain good anchorage, sheltered from all winds and sea, in a depth of 11 fathoms ($20^{m}1$), in the bight immediately westward of Boaya point, about one cable offshore; the western side of this point is bold.

Chart 3816.

Southern side of South pass.—Subaang bay is an open bight on the southern side of South pass; the shore is low and wooded, and several small streams flow out. A spit, with a depth of 21 feet ($6^{m}4$) over its outer end, extends a quarter of a mile north-eastward from the western entrance point, situated 4½ miles south-eastward of Varadero point (*Lat. 13° 30′ N., Long. 120° 58′ E.*); in windy weather it becomes a dull red colour, due to the stirring up of the silt from the rivers along the coast.

The coastal bank, with a least depth of 2 fathoms ($3^{m}7$) over it, extends three-quarters of a mile off the south-western shore of the bay.

From the eastern entrance point of Subaang bay to Balete point, which is about 100 feet ($30^{m}5$) high and well wooded, 4 miles eastward, the coast is low and wooded, and is intersected by the delta of the Baco, Malaylay and Baruyan rivers. A spit of sand and coral, which dries, lies with its northern edge about half a mile westward of Balete point.

Calapan bay.—Light.—Calapan (Kalapan) bay, entered between Balete point and Calapan (Kalapan) point, is an open bight about 2½ miles wide at its entrance. The town of Calapan (Kalapan), the capital of Mindoro province, is situated at the head of the bay; it is small and of little commercial importance. A building and a pier, with a depth, in 1938, of about 13 feet ($4^{m}0$) at its head, are situated on the western side of Calapan point which is 290 feet ($88^{m}4$) high, and wooded, about half a mile from its extremity; the western and northern sides of the point are clear of dangers, but the eastern side is fringed by a narrow reef, which is steep-to.

Charts 3807, 943, 2661b, 1263.

Chart 3816.

A light is exhibited, at an elevation of 36 feet (11^{m}0), from a white concrete column, on the head of the pier at Calapan.

There is no good anchorage off Calapan. The recommended anchorage is in a depth of from 7 to 10 fathoms (12^{m}8 to 18^{m}3), rock, with the church bearing 177° and the extremity of Calapan point, 063°. The bottom is irregular and the edge of the shore reef is steep-to, so the anchorage should be approached with caution. If the wind freshens and has any northing in it, a choppy sea rises, landing is impossible, and the anchorage is unsafe. With strong north-easterly winds a fairly protected anchorage may be obtained by vessels with local knowledge westward of Calapan point, but necessarily very close in on account of the great depth. The south-eastern part of the bay is shoal.

Calapan is connected to the general telegraph system.

Off-lying islands and dangers.—Light.—Baco (Bako) islands are three wooded islands lying about 2¾ miles north-westward of Calapan point. The south-western island, the highest, has an elevation of 295 feet (89^{m}9). A reef, which dries, extends about a quarter of a mile eastward from the middle island. The channels between the islands are deep, but the strong tidal streams that prevail make it imprudent for a vessel to use them.

A shoal, with a depth of 7 feet (2^{m}1) over it, coral, rock, and sand, lies 8½ cables westward of the southern extremity of the south-western island and is steep-to.

A light (*Lat. 13° 29′ N., Long. 121° 11′ E.*) is exhibited on Baco (Bako) Chico, the north-eastern of the three islands.

Silonay (Silonai) island, 350 feet (106^{m}7) high, and wooded, lies one mile east-north-eastward of Calapan point. Rocks, which are steep-to, extend about half a cable south-eastward from the north-eastern end, and a bank, with depths of less than 3 fathoms (5^{m}5) over it, extends about three-quarters of a cable southward from the south-western end of the island.

Anaganahao island, 100 feet (30^{m}5) high, lies about 5½ cables southward of Silonay island; it is fringed by rocks, which extend about 1¼ cables from the northern side and 2 cables south-westward from the southern side. The channel between Anaganahao and Silonay islands is narrowed to a width of about a quarter of a mile, with depths of 5 fathoms (9^{m}1), by the shoals extending from either side, and has a least depth of 7 fathoms (12^{m}8). The tidal streams set strongly through this channel. Between Anaganahao island and the coast of Mindoro there is a channel about 2 cables wide with depths of over 5 fathoms (9^{m}1) between the shoals extending from either side, with a least depth of 34 feet (10^{m}4).

A 27-foot (8^{m}2) patch lies about 4 cables south-eastward of the extremity of Calapan point, and 1¾ cables offshore.

North pass.—Light.—North pass lies between the northern side of Verde island and the south coast of Luzon between Matoco point and Punas point, about 15 miles eastward. Verde island has been described on page 314.

The coast between Matoco point (page 311), on the northern side of North pass, and Pinagbacajan (Pinagbakahan) point, about 1¼ miles eastward, is rocky. Arenas point, about 1¼ miles east-south-eastward of Pinagbacajan point, consists of sand and stones, by which it may be

Chart 3816.

identified; it is low and clear of dangers. Talaji (Talahi) point, about 1½ miles eastward of Arenas point, is rocky and wooded; thence to Rosario point, about 5½ miles farther eastward, the coast is wooded and bordered by a sandy beach which is fringed by rocks. Rosario river flows out at the point of the same name; there is a bar at its mouth, with a depth of about 3 feet (0^{m}9) over it. Between Rosario point and Malabrigo point, about 4 miles south-eastward, the coast is sandy and wooded.

The town of Lobo is situated about one mile north-eastward of Rosario point, and there is a prominent white house standing about half a mile north-north-westward of the point.

Good anchorage may be obtained by vessels with local knowledge north-westward of Rosario point, in a depth of 12 fathoms (21^{m}9), about 1½ cables offshore, with Malabrigo Point lighthouse showing over Rosario point, bearing 118°, and the prominent white house, 036°. The depths at this anchorage decrease rapidly.

Anchorage may be obtained by vessels with local knowledge during northerly winds anywhere between Matoco point and Malabrigo point, but the coast is very steep-to, and at less than 2 cables offshore the depths are from 8 to 13 fathoms (14^{m}6 to 23^{m}8), coarse sand and gravel.

Malabrigo point is the south-western extremity of the broad headland formed by the spurs of Mount Lobo, 3,301 feet (1,006^{m}1) high, 3½ miles north-eastward. Punas point is the central, and Malagundi, the eastern point of the headland. The coast between them is of moderate elevation and well wooded, rocky between Malabrigo and Punas points, and bordered by a sandy beach, and rocks thence to Malagundi point. Punas point may be identified by some red patches at a short distance from the beach.

A light (*Lat. 13° 36′ N., Long. 121° 16′ E.*) is exhibited, at an elevation of 184 feet (56^{m}1), from a white circular tower on a white dwelling with a red roof, on Malabrigo point.

Charts 3816, 3817.

Southern side of Luzon.—Between Malabrigo point and the western entrance point of Sigayan bay, about 7½ miles north-eastward, the coast is high. Vessels with local knowledge may obtain anchorage between Malagundi point and Sigayan bay, but close offshore, as the coast is very steep-to. The bottom is generally coarse sand and gravel. Sigayan bay lies immediately westward of Locoloco (Lokoloko) point, which is situated about 6¾ miles north-eastward of Malagundi point. The north-eastern shore of the bay is fringed by a coral reef, covered at high water, and vessels should anchor well over in the western part of the bay.

Between Locoloco point and Bantigui point, about 4 miles north-eastward, the coastal hills are about 360 feet (109^{m}7) high, and wooded. This vicinity appears low from south-eastward, as there are high mountains on either side, but not behind, these points.

Tayabas bay is described on page 369.

Chart 3816.

NORTH-EASTERN SIDE OF MINDORO.—Coast.—Between Calapan point and the mouth of Lumangbayan river, about 13 miles south-eastward, the coast is low, densely wooded, intersected by

Chart 3816.

several small streams, and fringed by a grey sandy beach. Silonay (Silonai) and Navotas villages stand at the mouths of the rivers of the same names, at 2½ and 5½ miles, respectively, from Calapan point; Canipsan (Kanipsan) village stands at the mouth of the Kawayan river, about 8 miles south-eastward of Calapan point. Kawayan and Baluagan rivers flow out at the same point, and there is a small grassy islet at their confluence. This part of the coast is clear of dangers, and anchorage may be obtained in a depth of 15 fathoms ($27^{m}4$), mud, almost anywhere off it. The depths decrease gradually except at the bar, which extends about half a mile off the mouths of Kawayan and Baluagan rivers, where the depth decreases from 10 fathoms to one fathom ($18^{m}3$ to $1^{m}8$) in a distance of about half a cable. Nagiba and Lagarian points, situated 7 and 11 miles, respectively, south-eastward of Calapan point, are low and covered with light timber and brushwood; they are not prominent, and can only be identified when close offshore.

Naujan (Nauhan) is a town situated about 9 miles south-eastward of Calapan point and one mile inland, on the west bank of Baluagan river. The bar at the mouth of this river, as well as the bars at the mouths of the other rivers in this vicinity, nearly dry, and the river can only be entered by pulling boats at a favourable stage of the tide. The ebb stream in the river is very strong. Naujan is connected by telegraph with Calapan. Estrella village, which is the port of Naujan, is situated on the coast about half a mile east-north-eastward of the town; a large warehouse on the beach is noticeable from seaward.

Anchorage may be obtained by vessels with local knowledge, exposed to north-easterly winds, north-eastward of the warehouse, in a depth of 15 fathoms ($27^{m}4$), mud.

Lumangbayan river, of which Naujan (Nauhan) river, flowing from Lake Naujan (Nauhan), is a branch, flows out about 4 miles south-eastward of Estrella (*Lat. 13° 20′ N., Long. 121° 19′ E.*); it is one of the largest rivers in northern Mindoro, and forms the dividing line between the low land and the mountainous district round Pola bay, about 6 miles south-eastward. Lumangbayan village is situated on the coast northward of the mouth of the river.

Charts 3816, 3817.

Between a point about 2¼ miles south-eastward of the mouth of Lumangbayan river and Balingawan (Balingauan) point, about 3¾ miles east-south-eastward, and thence to Anahauan point, about 2¼ miles southward of Balingawan point, the coast is very rugged and indented, the points, which are cliffy, varying in elevation from 50 to 150 feet ($15^{m}2$ to $45^{m}7$), and being densely wooded. The mountains, which approach close to the coast in this vicinity, are densely wooded, and attain an elevation of over 1,400 feet ($426^{m}7$). Some of these mountains terminate in well-defined peaks, two of which show well from seaward, and owing to their peculiar outlines, cannot readily be mistaken.

Mount Naujan (Nauhan), one of these peaks, is 1,380 feet ($420^{m}6$) high, and densely wooded; it lies 1½ miles southward of the entrance of Lumangbayan river, and about one mile inland. The summit lies at the western extremity of a flat ridge which slopes towards the north. Dome hill, the other prominent peak, is a rounded, dome-shaped hill, 845 feet ($257^{m}6$) high, and densely wooded on the southern side of Lumangbayan river, about 2 miles north-westward of Mount Naujan.

Tujud (Tuhud) island, 150 feet ($45^{m}7$) high, wooded, and bordered by brown cliffs except on its south-western side, lies about a quarter of mile offshore and one mile north-westward of Balingawan point. It is bold and steep-to on its seaward side, but is connected with the coast of Mindoro by a reef, which dries. A detached rock, 15 feet ($4^{m}6$) high, surrounded by rocks awash, lies about half a cable south-westward of Tujud island.

Balingawan point differs from the other points in the vicinity, for instead of rising gradually and continuously from the cliffs towards the interior, it slopes down forming a saddle which extends across in an easterly and westerly direction at a very slight elevation.

Pola bay.—Pola bay, entered between Anahauan point and Dayap point, 4¼ miles south-eastward, is deep and clear of dangers, and the shores are generally steep-to. Anahauan point is densely wooded and bordered by low cliffs and rocks. A reef, on which there are several rocks, from 2 to 3 feet ($0^{m}6$ to $0^{m}9$) high, and others awash, extends about three-quarters of a cable eastward from the point and show up well from northward or southward. This reef, which mostly dries, continues southward for half a mile from the point, and extends to a maximum distance of a quarter of a mile offshore.

Dayap point is bordered by cliffs and large boulders ; it is clear of dangers and steep-to. It is formed by the northern extremity of a spur extending northward from a sharp wooded peak, 1,400 feet ($426^{m}7$) high, about 1¼ miles inland.

About 2 miles south-south-westward of Anahauan point (*Lat. 13° 11′ N., Long. 121° 27′ E.*) is Tiguihan cove, the shores of which are fringed with reefs, leaving a small space near the entrance where small craft with local knowledge may obtain a partially sheltered anchorage but stern moorings to the shore are necessary. About three-quarters of a cable south-eastward of Tuntung point, the rocky point forming the southern side of Tiguihan cove, near the edge of the shore reef, is a prominent rock, 18 feet ($5^{m}5$) high, close eastward of which is another rock, about 3 feet ($0^{m}9$) high.

Pola river, with a depth of 2 feet ($0^{m}6$) on its bar, and Pula river, the bar of which dries, flow into the head of Pola bay, and between their mouths is a grey sandy beach from which the coastal bank extends from a quarter to half a mile. A valley covered with light timber and mangroves lies between the two rivers and extends several miles southward.

The town of Pola is situated on the western side of the entrance to the Pola river. A large storehouse with a galvanised iron roof is the most noticeable building ; the eastern side of it is painted black with the exception of a large door in the middle, and is visible from a considerable distance north-eastward.

Anchorages.—The best anchorage in Pola bay for large vessels is half a mile offshore, in a depth of 15 fathoms ($27^{m}4$), mud, with the storehouse at Pola bearing 230°, and the rock, 18 feet ($5^{m}5$) high, 282°. Small vessels may anchor closer in, in a depth of 10 fathoms ($18^{m}3$), mud, with the storehouse bearing 248°, and the 18-foot rock, 302°. At times during the North-east monsoon these anchorages are unsafe.

Coast.—Light.—The coast between Dayap point and Dumali point, 3¼ miles south-eastward, is fringed with a narrow coral reef,

Charts 3816, 3817.

which partly dries. This stretch of coast is steep-to and can be safely approached within half a mile. Mount Dumali, 2,498 feet ($761^{m}4$) high, and densely wooded to its summit, lies about 2½ miles westward of Dumali point, and is very prominent.

A light is exhibited, at an elevation of 173 feet ($52^{m}7$), from a white circular steel tower, on Dumali point.

Chart 3817.

EASTERN SIDE OF MINDORO.—Coast.—Lights.—Between Dumali point and Bugol point, about 3½ miles south-westward, the coast is steep-to and clear of dangers, thence to Duyagan point, about 28 miles southward, it is low, flat, and sandy, without any prominent features, and is well wooded, the trees being from 50 to 80 feet ($15^{m}2$ to $24^{m}4$) in height. For a distance of from 5 to 8 miles inland the land is only from 12 to 25 feet ($3^{m}7$ to $7^{m}6$) high.

Between Bugol point and the mouth of Sucol (Sukol) river, about 19 miles southward, the coast is clear of dangers, and may be safely navigated at a distance of three-quarters of a mile, thence to Duyagan point, the coastal bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends offshore some distance, and at a point about 7½ miles northward of Duyagan point it extends about one mile offshore.

Pinamalayan village is situated about three-quarters of a mile northward of the mouth of the river of the same name, about 2 miles south-westward of Bugol point. Landing may be effected on the beach in front of the village, but when this is not practicable pulling boats can enter the river, the bar of which is very shallow.

A light (*Lat. 13° 02′ N., Long. 121° 30′ E.*) is exhibited, at an elevation of 33 feet ($10^{m}1$), from a concrete column, on the beach at Pinamalayan.

A light is exhibited, at an elevation of 32 feet ($9^{m}8$), from a concrete tower, at Bongabong village, situated at the mouth of Sucol river. There is a depth of 3 feet ($0^{m}9$) on the bar of the river.

Anchorages.—Anchorage may be obtained about 4 cables offshore, in a depth of 13 fathoms ($23^{m}8$), with the middle of Pinamalayan village bearing 271°, and the tangent of the land north-eastward, 052°, or closer in, in a depth of from 4 to 10 fathoms ($7^{m}3$ to $18^{m}3$), sand.

Anchorage may be obtained in depths of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$), half a mile offshore, off Sumagui village, about 14 miles southward of Pinamalayan; also off Bongabong, in a depth of 12 fathoms ($21^{m}9$), with the light-tower bearing 243°, distant 5 cables.

Coast.—Duyagan point is low, sandy, and steep-to; it is covered with trees, about 90 feet ($27^{m}4$) high. At times discoloured water from the numerous streams is found at a considerable distance offshore. Between Duyagan point and Balanga point, 7½ miles south-westward, the coast is similar in appearance to that northward. From Duyagan point to Ticlin (Tiklin) point, 3¾ miles south-westward, the coast is steep-to and clear of dangers. The coastal bank extends about half a mile eastward from Ticlin point and about one mile southward. Balanga point, the first elevation near the coast southward of Mount Dumali, is formed by a hill, 252 feet ($76^{m}8$) high, the seaward cliffs of which have a reddish appearance.

Off-lying reef.—Langauin reef is an extensive reef of coral rocks, one of which is awash, lying about 2 miles southward of Ticlin point,

Charts 3807, 943, 2661b, 1263.

Chart 3817.

and 1¼ miles offshore. Between the reef and the coast there is a 15-foot ($4^{m}6$) patch, and about 6 cables south-westward of the reef is a 22-foot ($6^{m}7$) patch. Maestre de Campo island (page 327) open eastward of Duyagan point, leads eastward of Langauin reef.

Mansalay bay.—Mansalay (Mansalai) bay, entered between Palaypay point, situated about half a mile west-south-westward of Balanga point, and Bugton point, about one mile farther south-westward, affords good shelter from all winds except those between south and east. Palaypay point is fringed by a reef, near the southern extremity of which, about 1½ cables offshore, is a prominent pinnacle rock, about 25 feet ($7^{m}6$) high. Foul ground, on which there is a rock awash, extends about half a mile offshore between Balanga and Palaypay points. Bugton point (*Lat. 12° 30′ N., Long. 121° 26′ E.*) is steep-to and clear of dangers; it is formed by a round-topped hill, 305 feet ($93^{m}0$) high, wooded to the water's edge; a similar hill, 280 feet ($85^{m}3$) high, lies about half a mile southward. Mansalay (Mansalai) village is situated at the head of the bay.

Anchorage.—Directions.—Good anchorage may be obtained by vessels with local knowledge, in Mansalay bay, in a depth of 7 fathoms ($12^{m}8$), mud, about 4 cables offshore, with the village bearing 316° and the 25-foot ($7^{m}6$) rock off Palaypay point, 091°, or closer in if the draught will permit.

Approaching this anchorage from northward, a vessel should keep Maestre de Campo island open eastward of Duyagan point until Langauin reef is passed; when Bugton point bears 271°, she should steer for it on that bearing, and give it a berth of a quarter of a mile, then alter course north-westward and steer for the village. Care should be taken not to approach the northern shore, which is fringed by a reef.

Coast.—Cogolong (Kogolong) bay, entered between Bugton point and Mansiol point, about 1½ miles southward, affords excellent anchorage in westerly winds for vessels with local knowledge, in depths of from 5 to 10 fathoms ($9^{m}1$ to $18^{m}3$), sand and mud. Vessels seeking shelter here should steer for the middle of the bay and anchor according to draught.

Mansiol bay, entered between Mansiol point and Colasi (Kolasi) point, about 1½ miles south-south-westward, is deep and free from danger. Mansiol point is bold, rocky, and surmounted by two grassy hills, 350 feet ($106^{m}7$) high. Several rocks, awash, extend about 1¼ cables eastward from Mansiol point; the outer rock dries about 5 feet ($1^{m}5$). Colasi point, on which are two hills, 121 and 145 feet ($36^{m}9$ and $44^{m}2$) high, respectively, is rocky and fringed by a steep-to coral reef, which extends a quarter of a mile offshore.

Colasi (Kolasi) bay, on the southern side of Colasi point, is a sandy bight with a small stream flowing into its head. Small vessels with local knowledge may obtain anchorage, sheltered from westerly winds, in depths of from 5 to 10 fathoms ($9^{m}1$ to $18^{m}3$), sand. From Colasi (Kolasi) village, in the southern part of the bay, the coast is fringed by mangroves nearly to Pocanil point, about 2 miles southward, and bordered by a coral reef which extends about a quarter of a mile offshore, and outside which the depths gradually increase.

Pocanil point is surmounted by a prominent hill, 515 feet ($157^{m}0$) high; on the eastern and southern sides is a steep yellow limestone cliff. Pocanil (Pokanil) islet, 154 feet ($46^{m}9$) high, wooded, and pre-

Charts 3807, 943, 2661b, 1263.

Chart 3817.

cipitous, lies about 2 cables eastward of Pocanil point, with which it is connected by a reef which dries. Pocanil rock, a sharp, bare, pinnacle rock, 35 feet (10^{m}7) high, lies about 1½ cables eastward of Pocanil islet. The eastern side of the rock is steep-to and clear of dangers, but the channel between it and Pocanil islet is foul. Pocanil (Pokanil) bay, entered between Pocanil rock and a point three-quarters of a mile southward, is a small bight which affords easy and convenient anchorage in the middle, in depths of from 10 to 12 fathoms (18^{m}3 to 21^{m}9), soft sticky mud.

Buyallao peninsula, between Pocanil and Soguicay bays, is high and densely wooded; its coast is rocky and steep-to. Mount Namalayan, about 1¼ miles within Buyallao point, the eastern extremity of the peninsula, is 885 feet (269^{m}7) high, densely wooded with dark trees, and prominent. Buyallao point (*Lat. 12° 22′ N., Long. 121° 27′ E.*) slopes gradually from Mount Namalayan, and terminates in a low, rocky shelf, which is steep-to and clear of dangers.

Buyallao island, separated from the northern side of Buyallao peninsula by Buyallao pass, is 531 feet (161^{m}8) high, and densely wooded; its eastern and south-eastern points are steep cliffs, 150 feet (45^{m}7) high, and steep-to. Close off the north-eastern side of the island are two rocks, the outer one 112 feet (34^{m}1) and the inner one 53 feet (16^{m}2) high. They are connected to the island by reefs, but the outer rock is steep-to on the seaward side.

Buyallao pass has a least navigable width of about 1½ cables, with a 2-fathom (2^{m}7) coral patch in the middle of the narrowest part. Anchorage in this pass is not recommended, the space being limited, and the bottom hard sand and coral, affording poor holding ground.

Chart 971.

Soguicay bay. — Soguicay (Soguikay) bay is entered between Buyallao point and Pandan point, 5½ miles south-westward. The shores are fringed with mangroves and bordered by reefs and mud flats. Soguicay (Soguikay) island lies in the middle of the bay, about three-quarters of a mile offshore. The northern part of the island is composed of mangroves, and the entire island is fringed by reefs, which partly dry, extending about a quarter of a mile from its eastern and southern sides; foul ground extends half a mile from the southern extremity. Between the island and the head of the bay are two detached reefs which dry and one awash; and between the southern point of the island and Cabug (Kabug) point, about three-quarters of a mile north-north-eastward of Pandan point, there is an extensive shoal, with a least depth of 4½ fathoms (8^{m}2) over it.

Anchorage. — Directions. — Soguicay bay is the best typhoon anchorage on the coast of Mindoro. Good anchorage may be obtained westward or north-westward of Soguicay island clear of the detached reefs, in depths of from 12 to 20 fathoms (21^{m}9 to 36^{m}6), soft sticky mud, and well protected.

A vessel entering Soguicay bay from northward should steer for Panangiran peak (chart 3821), a sharp peak, 2,367 feet (721^{m}4) high, situated 8 miles west-north-westward of the head of the bay, bearing 286°, which leads midway between the northern point of Soguicay island and the northern shore of the bay; when abeam of this point, she should steer 255° for about half a mile, heading about half a cable

Charts 3807, 943, 2661b, 1263.

Chart 971.

southward of Soguicay (Soguikai) village, on the western shore of the bay, and pass midway between the northern detached reef which dries, and the reef awash, 2¾ cables southward of it, then steer 226°, and anchor in a depth of 14 fathoms (25m6), mud, when the northern point of Soguicay island is in line with the southern tangent of Buyallao peninsula, bearing about 087°.

To enter from southward from a position about three-quarters of a mile off Pandan point, the vessel should steer 342° and pass about a quarter of a mile eastward of Cabug point; when the southern point of Soguicay island is in line with the southern side of Buyallao point, bearing about 068°, she should steer 348°, which will lead to the anchorage mentioned above.

Coast.—Pandan point is a rocky, precipitous headland, 460 feet (140m2) high, and covered with grass. Pandan reef, with a least depth of 1¼ fathoms (2m3) over it, lies about 4 cables south-eastward of Pandan point, with a deep narrow channel between.

Pandan bay, lying westward of Pandan point, affords anchorage near the head, in depths of from 6 to 20 fathoms (11m0 to 36m6), sand and mud, protected from north-easterly winds.

The shores of Pandan bay consist of steep rocky cliffs, densely wooded; the tops of the hills are covered with scrub. Vessels intending to anchor should not stand too far northward, as the head of the bay is foul.

Tambaron island (*Lat. 12° 16′ N., Long. 121° 23′ E.*), 470 feet (143m3) high, and wooded, is separated from Badian point, the western entrance point of Pandan bay, by Tambaron pass. The sides of the island are steep-to and clear of dangers.

Tambaron pass is deep and tortuous, and has a navigable width of only about 75 yards (68m6) at its eastern end.

Masin island, 251 feet (76m5) high near the southern end, has a lower hill at the northern end, which gives the island a saddle-shaped appearance from eastward or westward. Masin point, the southern extremity, is steep, rocky, and about 75 feet (22m9) high, with a few trees on it. Masin pass, which separates Masin and Tambaron islands, has a least navigable width of about 120 yards (109m7), with a least charted depth of 6 fathoms (11m0) at its north-eastern end.

Bulalacao bay.—Bulalacao (Bulalakao) bay, entered between Badian point and Tambi point, about 2½ miles west-north-westward, is clear of dangers except in the north-eastern part, where a bank, with a least depth of 3 feet (0m9) over it, extends about 3½ cables offshore. Bulalacao (Bulalakao) is a small town situated in the northwest corner of the bay; it is of little commercial importance.

Lagara cove is a small inlet on the eastern side of Bulalacao bay about three-quarters of a mile northward of Badian point. All the points are high and steep, and the inlet is enclosed by hills except for a low neck of land on the south-eastern side of its head. The two arms extending northward and eastward from this anchorage are shallow.

Tambi point is a black and yellow bluff, about 50 feet (15m2) high, covered with trees, and is steep-to and clear of dangers. Northwestward of the point the land rises gradually, and is 570 feet (173m7) high about three-quarters of a mile inland.

Anchorages.—Good anchorage may be obtained in Bulalacao bay,

Charts 3817, 3821, 3807, 943, 2661b, 1263.

Chart 971.

sheltered from winds except those between south-south-east and south-west, towards the head, in depths of from 5 to 20 fathoms ($9^{m}1$ to $36^{m}6$) mud and sand. The usual anchorage is south-eastward of the town according to draught.

The usual South-west monsoon enters with much force, and it is hardly possible to anchor close enough to the western shore to be protected from it. The depths off the head of the bay, which has a low sandy shore, are regular; the bottom is sandy with scattered pieces of soft coral to depths of 5 fathoms ($9^{m}1$), where the mud begins. Several small rivers flow through the mangrove swamp into the head of the bay.

A sheltered anchorage may be obtained by small craft with local knowledge near the inner end of Lagara cove, where there is a width of about 1½ cables and a depth of 12 fathoms ($21^{m}9$), mud.

Coast.—From Tambi point to abreast Aslom islet, 3½ miles westward, the coast is bordered by sand and mangroves, backed by densely wooded hills. It is fringed by a narrow reef, which partly dries and outside which the depths increase gradually. Thence to Buruncan point (*Lat. 12° 13′ N., Long. 121° 15′ E.*), about 3¾ miles southward, the coast is bluff, rocky, and generally steep-to and clear of dangers. Buruncan peninsula, which terminates in Buruncan point, has several high ridges extending in a northerly and southerly direction, with numerous peaks from 150 to 250 feet ($45^{m}7$ to $76^{m}2$) above the general level and reaching an elevation of 1,200 feet ($365^{m}8$). The sides of the hills and ridges are covered with thick, dark forests. Buruncan point and the coast westward have been described on page **44**.

Off-lying islets and shoals.—Masin bank, with a depth of 7 fathoms ($12^{m}8$) over it, lies about 2 miles westward of Masin point.

Bula shoal, with a depth of 4 fathoms ($7^{m}3$) over it, lies about 3¾ miles westward of Masin point.

Aslom islet, 105 feet ($32^{m}0$) high, is separated from the eastern side of the Buruncan peninsula, at its northern end, by a narrow channel. The bight in the peninsula, off which the islet lies, has mangroves at its head, and is fringed by a reef, which dries, with shoal water extending about 4 cables from the head. Fairly good anchorage may be obtained westward of the islet, in a depth of 12 or 13 fathoms ($21^{m}9$ or $23^{m}8$), sand and mud, but care should be taken to avoid a 3-fathom ($5^{m}5$) patch lying about 1¾ cables from the middle of the western side of the islet.

Silat islet, 45 feet ($13^{m}7$) high, lies about one mile south-south-eastward of Aslom islet. A group of rocks, 15 feet ($4^{m}6$) high, lies about 3 cables north-westward of Silat islet; between these rocks and Silat islet there is a deep channel about one cable wide, with a least depth of 4 fathoms ($7^{m}3$). A bank, with a depth of 5½ fathoms ($10^{m}1$) at its outer end, extends about half a mile south-eastward from Silat islet.

Alibatan islet, 90 feet ($27^{m}4$) high at its southern end, lies about 1½ miles southward of Silat islet. The channel between the two islets and that between them and the coast westward, are clear of dangers. A bank, with depths of less than 10 fathoms ($18^{m}3$) over it, extends 5½ cables south-south-eastward from Alibatan islet; there is a least depth of about one foot ($0^{m}3$) on the bank, situated about 3 cables south-eastward of the islet; there are usually breakers on this patch.

Charts 3817, 3821, 3807, 943, 2661b, 1263.

Chart 971.

The islets described above are fringed by reefs, and have bushes and small trees on their summits.

Charts 971, 3807.

SEMIRARA ISLANDS.—Semirara islands are a group of eight islands lying off the southern end of Mindoro, and extending to a distance of 28 miles south-eastward of Buruncan point.

Chart 971.

Semirara island.—Semirara island, the largest of the group, is divided into two parts by a mangrove swamp and low neck of land, about 3½ miles from the northern end of the island. The town of Semirara is situated on the eastern side of the island on the low neck, and the villages of Tinabooc (Tinabook) and Alegria stand on the south-eastern and south-western coasts, respectively. The island has few resources. On the northern part of the island are several hills, the highest of which has an elevation of 313 feet ($95^{m}4$) and is almost bare of trees. The southern part is formed by a ridge of hills extending from the low neck to Talisay point, the southern extremity of the island. About 2½ miles northward of Talisay point is the summit of the island, 568 feet ($173^{m}1$) high. Tungao point, the northern extremity, and Talisay point are both steep-to and clear of dangers.

The eastern coast is fringed by a reef, which partly dries, and abreast Alimanga point, 2¾ miles south-eastward of Tungao point, extends one mile offshore with shoal water about 5 cables outside it. There is no good anchorage off the town of Semirara, as the edge of the reef is very steep-to; vessels wishing to communicate with that place usually anchor off the western side of the island.

The western side of the island is generally fringed by a reef which partly dries, and which, immediately southward of Semirara anchorage, extends 1¼ miles offshore.

Semirara anchorage.—About 2¼ miles southward of Tungao point (*Lat. 12° 07′ N., Long. 121° 21′ E.*) is the northern entrance point of a bight known as Semirara anchorage. At the head of this bight is a bay, which is filled with the fringing coral reef which mostly dries; the remainder of the bight is much encumbered with islets, rocks, and shoals, but, there is a space protected from winds, except those between south-west and west, where anchorage may be obtained by vessels with local knowledge, in a depth of 15 fathoms ($27^{m}4$), with Ilogao point, situated about 1¾ miles south-eastward of the northern entrance point of the bight, bearing 060°, and the tangent of the land northward, 347°. Ilogao point is high, dark, and well defined.

Small vessels may anchor farther in, in a depth of 12 fathoms ($21^{m}9$), with Ilogao point bearing 060°, and Twin rocks, about 6 feet ($1^{m}8$) high, situated about 6 cables westward of Ilogao point, 329°. This anchorage may be used in any except the worst weather, and landing may always be effected in small boats.

Off-lying danger.—A shoal, with a depth of 5¼ fathoms ($9^{m}6$) over it, lies 3¼ miles west-south-westward of Tabonan point, which is situated about 1½ miles southward of Tungao point.

Libagao and Nagubat islands.—Libagao and Nagubat islands lie about 6½ and 3½ miles, respectively, north-north-eastward of the northern extremity of Semirara island. Libagao island is 240 feet

Charts 3821, 3807, 943, 2661b, 1263.

Chart 971.

($73^{m}2$) high in the eastern part, while the western part is low, flat, and sandy; it is covered with low trees and is fringed by reefs, which at no point extend to a distance of more than a quarter of a mile. The island is uninhabited.

Nagubat island is low and sandy, and fringed by a reef which extends about 3 cables northward; it is covered with trees, about 60 feet ($18^{m}3$) high. There are a few inhabitants. About one mile north-eastward of the island is a coral reef, with a least depth of about one foot ($0^{m}3$) over it. Between this reef and Libagao island there is a deep channel about 1¼ miles wide, with a 9-fathom ($16^{m}5$) patch near the middle. The channel between the reefs fringing Nagubat island and the northern end of Semirara island is about 2 miles wide, and except for a rocky 7-fathom ($12^{m}8$) patch, about 1¼ miles southward of Nagubat island, is deep and clear of dangers.

Sibolon island.—Sibolon island, about 10½ miles eastward of Alimanga point, Semirara island, is low and covered with trees, about 130 feet ($39^{m}6$) high. Around the west point and north-western and southern sides is a sand beach, and from it a reef extends from 2½ to 3½ cables and is steep-to at its edge. On the eastern side there are limestone cliffs from 20 to 30 feet ($6^{m}1$ to $9^{m}1$) high, and no fringing reef. The only anchorage off it is in a depth of from 10 to 25 fathoms ($18^{m}3$ to $45^{m}7$), with the west tangent of the island bearing 030°, and the south tangent, 068°.

Charts 971, 3821.

Caluya and Sibaton islands.—Caluya (Kaluya) and Sibaton islands, about 8 miles east-south-eastward of Semirara island, lie about half a mile apart and are connected by reefs, except for a narrow channel, with a depth of 1½ fathoms ($2^{m}7$) near the southern point of Sibaton island (*Lat. 11° 59′ N., Long. 121° 33′ E.*).

Near the southern end of Caluya island is a round hill, 558 feet ($170^{m}1$) high, and covered with bamboo; from this summit the land slopes regularly to the northern point. All round the island the points are of black limestone and there are sandy beaches in all the bights. Sibaton island is a low sandy limestone island covered with trees; on the northern side are low black limestone cliffs. Both islands are generally fringed with reef which extends 1¼ miles south-south-eastward from Sibaton island, and is awash, and about three-quarters of a mile from the northern end of Caluya island; from Ibot point, the south-eastern extremity of Caluya, the reef extends about a quarter of a mile.

The town of Caluya (Kaluya) is situated on the western side of Caluya island, and Imba village, on the northern point of the same island. Sibaton village stands on the southern side of the island of the same name.

Chart 3821.

The best anchorage during the North-east-monsoon for vessels with local knowledge, is in a depth of from 5 to 10 fathoms ($9^{m}1$ to $18^{m}3$), off the western side of Caluya island, with the town of Caluya bearing 091°, and the tangent of the western side of the island southward bearing between about 180° and 182°, open eastward of the eastern extremity of Sibay island. A bank, with a depth of 4 fathoms ($7^{m}3$) at its outer end, extends about 3 cables offshore, westward of the town. During bad south-westerly weather anchorage may be obtained near

Charts 3807, 943, 2661b, 1263.

Chart 3821.

the edge of the fringing reef, in a depth of 16 fathoms ($29^{m}3$), off the bight near the middle of the eastern side of Caluya island.

Sibay island.—Sibay (Sibai) island, the southernmost of the Semirara islands, lies with its eastern extremity about 3 miles south-south-westward of Caluya island. The summit, 275 feet ($83^{m}8$) high, lies in the middle of the north coast, and is covered with a dark undergrowth, with steep black cliffs in front of it. Except for some small trees at its extremities, the island is entirely bare, and only bamboo and a few houses are visible from seaward. The island is mostly fringed by a narrow, steep-to reef, but at the south-eastern end between Bacong (Bakong) point, the eastern extremity, and Tangaion point, about 1½ miles south-south-westward, it extends about half a mile offshore, and on the southern side near the western end, nearly one mile; on the outer edge of the latter there is a rock which dries 3 feet ($0^{m}9$). There are several small villages on the island. There is no anchorage round the island, except on the spits at the south-eastern and north-western points, both of which are equally exposed in both monsoons, and are of hard sand and large coral heads.

Panagatan cays, about 5 miles westward of Sibay island, have been described on page 48.

Chart 3817.

TABLAS STRAIT.—Tablas strait is the name given to the channel between Mindoro on the west, and Marinduque, Banton, Simara, and Tablas islands on the east.

Maestre de Campo island.—Maestre de Campo island, about 13 miles south-eastward of Dumali point (*Lat. 13° 07′ N., Long. 121° 33′ E.*) (page 320), is sparsely wooded. The summit from eastward or westward appears like a ridge with three distinct hills, the highest of which, near the northern part of the island, is 1,130 feet ($344^{m}4$) high. The coast is rugged and rocky, and in places the cliffs are 100 feet ($30^{m}5$) high; it is steep-to and may be safely approached at any point within a quarter of a mile. The numerous bights afford anchorage and protection to small craft with local knowledge. Small quantities of copra and tobacco are raised. Agbatang bay is a small inlet on the southern side of the island; its shores are fringed with coral, and it is only fit for small craft.

Port Concepcion, on the south-eastern side of the island, is the principal anchorage. It is 2¾ cables wide at its entrance between Batarya and Tunggo points, and has considerable depths. Anchorage may be obtained, with protection from all winds except those from between east and south-east, in the middle of the port, in depths of from 16 to 20 fathoms ($29^{m}3$ to $36^{m}6$), rock and sand. Small vessels may anchor farther northward off Concepcion village, on the eastern side, about 3½ cables north-westward of Batarya point. The shores of the bay are fringed by a coral reef, except at the head, where there is a sandy beach. The port is of no commercial importance.

Bidoos bay, immediately eastward of Port Concepcion, from which it is separated by a narrow tongue of land, is open southward, fringed with coral, and is only fit for small craft.

Dos Hermanas islands.—Dos Hermanas islands consist of Carlota and Isabel islands, 195 and 213 feet ($59^{m}4$ and $64^{m}9$) high, respectively, and steep-to, lying about 11 miles north-eastward of Maestre de

Charts 3807, 943, 2661b, 1263.

Chart 3817.

Campo island. From a distance the two islands present a similar appearance, each with a flat top and sloping in a terrace at each end. The coast consists of cliffs, from 20 to 80 feet ($6^{m}1$ to $24^{m}4$) high, underworn by the sea. On the northern side of each island is a narrow fringe of coral, which dries, and from the north-eastern side of Carlota, a coral spit slopes gradually to a depth of 25 fathoms ($45^{m}7$) at a distance of half a mile. Both islands are densely wooded. Carlota island is inhabited. The best anchorage is over the coral spit on the north-eastern side of Carlota.

Banton and Bantoncillo islands.—Banton island, about 7 miles south-eastward of Isabel island, consists of a central ridge, 2,016 feet ($614^{m}5$) high at the northern end, and occupying the larger part of the island. On the western side of the island about one mile north-westward of Pogot point, the south-western extremity of the island, is the entrance to Mainit bay, on each side of which is a smaller bight. None of these affords anchorage, being too deep and exposed. The sides of the island are formed of dark limestone cliffs, from 40 to 80 feet ($12^{m}2$ to $24^{m}4$) high, and bordered by coarse sand beaches and large rocks. A narrow, steep-to coral reef fringes the entire island except the north-eastern and south-western points, where the cliffs descend precipitously into deep water. Inland there are occasional clumps of trees and tall grass, and a few cultivated fields are visible from seaward.

The town of Jones is situated on the eastern coast amongst the hills about three-quarters of a mile southward of Tugbungan point (*Lat. 12° 58′ N., Long. 122° 06′ E.*), the north-eastern extremity of Banton island, and is bordered by a shingle beach ; it contains a church and a fort.

An indifferent anchorage may be obtained by vessels with local knowledge off Banton island, either off the point southward of Jones or on a coral ridge off Tumalum point, the south-eastern extremity, both in a depth of 15 fathoms ($27^{m}4$). Landing is difficult in any but the smoothest sea, and is dangerous when there is any surf.

Bantoncillo island, 320 feet ($97^{m}5$) high, and wooded, lies 3¼ miles south-westward of Pogot point. Close off the south-western point of the islet is a bare pinnacle rock, 87 feet ($26^{m}5$) high. The islet is bordered by coarse shingle beaches and limestone ledges, and fringed by a narrow, steep-to, coral reef.

Simara island.—Light.—Simara island, about 4 miles southward of Banton island, is 755 feet ($230^{m}1$) high. The coast is generally bold, with no indentations except at the south-western end, where there is a bight with a mangrove swamp, occupying the middle of the low western spit and entirely filled by reefs ; this bight can only be identified when close offshore. The north-western coast is low and fringed by large rocks lying along the edge of the narrow coastal reef, from a quarter to half a cable offshore. There are the usual low cliffs and coral beaches, but at Kapilejan (Kapilehan) point, the north-eastern extremity, the face of the cliff is 60 feet ($18^{m}3$) high, with no reef at its foot. A coarse shingle and sandy beach borders the southern point. The reef is widest off the town of Corcuera, on the southern side of the island, and westward of it, where there are large coral heads along its edge and a slightly greater depth inside. Landing is possible only in fine weather, or in the sheltered side of the island, and should not be attempted when there is any surf.

Charts 3807, 943, 2661b, 1263.

Chart 3817.

A light is exhibited, at an elevation of 66 feet ($20^{m}1$), from a white concrete tower, on Corcuera point, the western extremity of the island.

The town of Corcuera is situated on an open sandy beach; it contains a church, and there is a ruined fort on the hill behind it.

Tidal streams.—The north-east-going stream between Banton and Simara has a rate of from half a knot to three-quarters of a knot.

Off-lying danger.—Ranger reef is a steep-to coral reef, with a depth of 2 fathoms ($3^{m}7$) over it, lying about 1½ miles eastward of the south-eastern part of Simara island. It is only occasionally discerned by discoloration.

Two coral patches, with a depth of 8 fathoms ($14^{m}6$) over each, lie about 2¼ miles off the eastern side of Simara island and another 8-fathom ($14^{m}6$) patch lies about 6 cables off the south-eastern part of the island. Except for the latter patch there is a deep channel between Ranger reef and the south-eastern side of Simara island.

Anchorage may be obtained by vessels with local knowledge, in depths of from 11 to 14 fathoms ($20^{m}1$ to $25^{m}6$), between Ranger reef (*Lat. 12° 48′ N., Long. 122° 06′ E.*) and the south-eastern side of Simara island, and close offshore with Bantayan hill, the summit of the island, bearing between 300° and 315°.

Charts 3817, 3821.

TABLAS.—Tablas, an island situated about 27 miles eastward of the southern part of Mindoro, has a densely wooded central range traversing its length. At the north-eastern extremity is the peak known as Tablas summit, 2,284 feet ($696^{m}2$) high. There is no good harbour except Looc bay (page 330), on the western side, but sheltered anchorage may be obtained on either side of the island, according to the season. There are no towns of importance. The usual steamer track between Manila and the principal ports in the southern Philippines passes northward and eastward of the island.

Guindauahan islet, 480 feet ($146^{m}3$) high, and Origon rock, with two pinnacles, 110 and 40 feet ($33^{m}5$ and $12^{m}2$) high, lie close off the northern point of Tablas. A shoal, with a depth of 28 feet ($8^{m}5$) over it, sand and coral, lies 2 miles westward of Guindauahan islet. The southern extremity of Cobrador island (page 340), bearing about 108°, and open northward of Guindauahan islet, leads well northward of the shoal. The northern coast of Tablas is steep-to and clear of dangers. There are tide-rips between Guindauahan islet and the 28-foot ($8^{m}5$) shoal.

Western side of Tablas.—Light.—The western coast of Tablas is formed by the western slope of the central mountain ridge, which is narrow and well defined. Near the middle of the range, situated about 14 miles southward of the northern extremity of the island, is Mount Bitaogan, 2,164 feet ($659^{m}6$) high, which appears as a rounded knob from eastward and westward, and a sharp peak from northward and southward. Mount Lunas, about 3 miles north-eastward of Looc bay, is a black ridge, 1,556 feet ($474^{m}3$) high, long and rounded from eastward and westward, and a sharp appearance from northward and southward; this peak lies at the southern end of the range. In the southern part of the island there are several sharp conical hills, all bare except Mount Malbug, 904 feet ($275^{m}5$) high, about 7 miles northward

Charts 3807, 943, 2661b, 1263.

Charts 3817, 3821.

of Cabalian (Kabalian) point, the southern extremity of the island, and a hill on Calaton point (page 342), which are dark and wooded.

The coast is largely bordered by mangrove with numerous beaches of coral sand and some limestone cliffs. The coastal reef is continuous except off Guinauayan (Guinawayan) point, on the western side of the island, about 12½ miles north-north-westward of Cabalian point, and extends from 1¼ to 6 cables offshore. There are no off-lying dangers on the western side. There are several small villages on the west coast, off which anchorage may be obtained by vessels with local knowledge during the North-east monsoon.

The largest settlement on the west coast is Odiongan, standing on the southern shore of Odiongan bay, about midway between the northern and southern extremities of Tablas island.

A light is exhibited, at an elevation of 32 feet ($9^{m}8$), from a white concrete beacon, on the beach north-westward of Odiongan.

There is a mole at Batiano point, about 1¼ miles north-north-eastward of the light-structure, with a depth, in 1937, of 15 feet ($4^{m}6$) alongside.

Vessels may obtain anchorage, in a depth of about 5 fathoms ($9^{m}1$), mud, about half a mile north-westward of the light-structure. Northerly winds cause a heavy sea.

Bagulayac (Bagulayak) point, 2¾ miles west-south-westward of Odiongan light-structure, may be identified by a bare cliff and two rocks, 30 and 65 feet ($9^{m}1$ and $19^{m}8$) high. Colasi (Kolasi) hill, 552 feet ($168^{m}2$) high, about half a mile northward of Guinauayan point, is prominent from southward. Wayside rock, 15 feet ($4^{m}6$) high, lies close off Macatol (Makatol) point, situated about 5 miles south-south-westward of Bagulayac point.

Chart 972, plan of Port Look.

Looc bay.—Danger.—Light.—Looc (Look) bay, entered between Agoho point, about 8¾ miles north-north-westward of Cabalian point, and Cauit point (*Lat. 12° 15′ N., Long. 121° 59′ E.*), about 1¼ miles farther northward, is one of the best harbours of refuge in the Philippines, and the only sheltered anchorage on the western side of Tablas during the South-west monsoon. The shores are generally bordered with mangrove, with sandy beaches in front of Looc (Look) village, on the northern side of the port, and in the eastern bight. The fringing reef extends from 1¼ to 3¼ cables offshore all round, and is steep-to except on the northern and north-eastern shores, where there is a depth of 5 fathoms ($9^{m}1$) about 3½ cables offshore. The southern and eastern bights each have a detached reef in them, close offshore.

Cauit point is low and bordered by mangroves; there are two conical hills about half a mile northward of the point. The point is fringed by a reef which partly dries and extends about half a mile southward. Agoho point is 89 feet ($27^{m}1$) high, with black bluffs and bordered by mangroves; it is fringed by a reef, which extends about 1¼ cables northward, leaving a deep channel about 3¾ cables wide between it and the reef extending southward from Cauit point.

Looc reef, which dries 2 feet ($0^{m}6$) and is steep-to, lies about three-quarters of a mile east-north-eastward of Agoho point.

A light is exhibited from a concrete beacon on the northern extremity of Looc reef.

Charts 3807, 943, 2661b, 1263.

Chart 972, plan of Port Look.

Looc village stands on a low sandy shore at the western end of a large coconut grove. The church tower has a four-sided iron roof.

Anchorages.—Directions.—Vessels may obtain anchorage off Looc village, in a depth of 11 fathoms (20^{m}1), sand and mud, with the church tower bearing 029° and Cauit point, 294°, or closer in if necessary.

Anchorage may also be obtained in the southern arm, in a depth of about 17 fathoms (31^{m}1), about 1¾ miles from its head, with the point separating the eastern and southern arms bearing about 089°.

Charts 972, plan of Port Look, 3821.

A vessel from northward approaching Looc bay should pass about 4 cables westward of Guinauayan point, and steer for the 20-foot (6^{m}1) rock on the coastal reef one mile southward of Agoho point, bearing 147°, until Agoho point bears 091° when she should steer for it on that bearing until the church tower at Looc is in line with Mount Lunas, bearing 055°, when she should alter course on to this alignment, which leads through the middle of the entrance in a depth of 25 fathoms (45^{m}7). When Cauit point bears 331° she should alter course southward, and, with Cauit point astern, steer for the anchorage at the entrance to the southern arm.

If intending to anchor off the village, the vessel should keep the church tower in line with Mount Lunas until Cauit point bears 294°, and then steer 114° with the point astern, which will lead to the anchorage.

A vessel from southward should steer for Agoho point, bearing 091°, when it is about one mile off; when the church tower is in line with Mount Lunas she should proceed as directed above.

Chart 3821.

Coast. — From Agoho point to Tuctuc (Tuktuk) point (*Lat. 12° 11′ N., Long. 121° 57′ E.*), 3 miles southward, the coast is bordered by sand and mangrove, changing to rocky cliffs at Tuctuc point. The bight between these points is fringed by a reef which extends from a quarter to half a mile offshore, with the rock 20 feet (6^{m}1) high, mentioned above, on it. Tuctuc point terminates in a dark sugar loaf-shaped rock, 115 feet (35^{m}0) high, and is steep-to and clear of dangers.

Between Tuctuc point and Capid (Kapid) point, about 2 miles southward, there are high cliffs with sandy beaches in the bights between them; the coast is fringed by a steep-to reef, extending about 1¼ cables offshore. Capid point is 222 feet (67^{m}7) high, and is fringed by a narrow reef; thence to Santa Fe, about 1¾ miles eastward, the coast is bordered by mangrove, and thence to Cabalian point there are low rocks and boulders at all the points with sandy beaches between. The hills have a few trees and bushes on them.

Santa Fe is a small village situated at the head of a small inlet, entered between Canyayo point, situated one mile eastward of Capid point, and Tipolo point, about 6 cables southward of Canyayo point; in the village there is a house with a prominent iron roof.

Anchorage may be obtained by small vessels with local knowledge just inside the entrance to the inlet mentioned above, in a depth of 14 fathoms (25^{m}6) mud, with Canyayo point in line with Capid point, bearing about 279°, and the iron-roofed house, 065°. A convenient mark for entering is a large bushy black tree on a dark hill at the head of the inlet bearing 046°. At this anchorage there is about one cable swinging room.

Charts 3807, 943, 2661b, 1263.

Charts 3821, 3822.

Cabalian point is low, sandy and difficult to distinguish at night. A flat, steep-to, limestone ledge, on which there are rocks, about 6 feet ($1^{m}8$) high, extends over half a cable from it. Cabalian (Kabalian) banks, of coral and sand, with a least depth of 33 feet ($10^{m}1$) over them, extend from 1½ to 5½ miles southward of the point. Cabalian point should be given a berth of about one mile.

Chart 3821.

Off-lying islands.—Carabao (Karabao) island, 693 feet ($211^{m}2$) high, lies with Subay (Subai) point, its north-east extremity, 3½ miles south-westward of the southern end of Tablas. Its coast is steep-to and clear of dangers, the rocks that fringe it lying close offshore. On the eastern side there is a sandy beach, off which vessels may obtain anchorage, in a depth of 5 fathoms ($9^{m}1$). Anchorage may also be obtained, in a depth of 10 fathoms ($18^{m}3$), sand and rock, eastward of Taft village, situated about 1½ miles northward of the south-eastern extremity of the island, and in a depth of 6 fathoms ($11^{m}0$), sand, west-south-westward of Cogon (Kogon) village, on the south-western side of the island, and 2¼ miles west-north-westward of its southern extremity.

Borocay (Borokai) island, 285 feet ($86^{m}9$) high, lies about 2½ miles southward of Carabao island. The channel between them is deep and clear of dangers, but the tidal streams are very strong. The channel between Borocay island and the north-western end of Panay is about half a mile wide, and is clear of dangers in the fairway, but there are rocks on either side, and the tidal streams set through with great force. Anchorage may be obtained, in a depth of 3¾ fathoms ($6^{m}9$), on the western side of the island.

Charts 3807, 3809.

PANAY.—The north-western extremity of the island of Panay, is situated about 37 miles south-eastward of the south-eastern end of Mindoro. The south-eastern coast of Panay is separated from the island of Guimaras by a narrow strait. Near the western coast a chain of mountains extends in a curve from the north-western to the southern promontory, and from the middle of this chain another range branches off to the north-eastern promontory of the island, thus dividing the island into three natural districts, which form the provinces of Antique, Capiz, and Iloilo.

Panay is exceedingly fertile, being well irrigated by numerous mountain streams; and it supports a large population of Visayans, with a few Negritos in the mountains. It produces rice, sugar, cotton, coffee, tobacco, pepper, and cacao. Ebony and sapanwood are obtained from the forests, while pearl shells, tortoise-shell, and trepang are found on its coasts. It is one of the most densely populated and highly cultivated islands of the Philippines. It has three large towns —Kalibo, Capiz, and Iloilo, the latter a port of entry having an extensive trade.

Chart 3821.

WESTERN SIDE OF PANAY.—**Coast.**—Potol point (*Lat. 11° 56′ N., Long. 121° 57′ E.*), the northern extremity of Panay, is flat and sandy, with a few trees on it. About half a mile north-eastward of the point is a group of rocks and islets. Small craft with

Chart 3821.

local knowledge can pass between them and the coast of Panay. About midway between Potol point and Nasog point, about 4½ miles south-westward, is a shoal, with a depth of 22 feet ($6^{m}7$) over it, lying over one mile offshore. Malay river flows out about midway between the two points, and there is a depth of 5 fathoms ($9^{m}1$) sand, half a mile north-westward of its entrance.

The promontory forming the north-western end of Panay terminates in a steep coast, the most salient points of which are Nasog and Pucio. The highest point of the promontory is Mount Tinayunga, which has an elevation of 2,973 feet ($906^{m}2$).

Nasog point, the north-western extremity of the island, is a wooded bluff, 170 feet ($51^{m}8$) high, and steep-to. Good anchorage may be obtained by vessels with local knowledge on the northern side of the point. About 3½ miles southward of the point is Buruanga village, situated in a small bight at the mouth of Buruanga river. A spit, with a depth of 2 fathoms ($3^{m}7$) over it, extends a quarter of a mile offshore westward of the village. Anchorage may be obtained by vessels with local knowledge, in depths of from 3½ to 5 fathoms ($6^{m}4$ to $9^{m}1$), off a beach near the mouth of the river. Between Buruanga and Pucio point, 5¾ miles south-south-westward, the coast is fronted with detached coral rocks, and bordered by high rocky cliffs over which cascades fall. Pucio point, which resembles Nasog point, is 596 feet ($181^{m}7$) high, and bordered with rocks which extend some distance from it.

Between Pucio point and Jinalinan (Hinalinan) village, 13½ miles eastward, the coast is steep-to and clear of dangers, except for a detached 16-foot ($4^{m}9$) patch lying half a mile offshore, southward of San Roque village, situated 8½ miles eastward of Pucio point, and the coastal bank, with a depth of 2 fathoms ($3^{m}7$) over its outer edge, situated about half a mile south-eastward of Tingit village, about 1¾ miles westward of Jinalinan. This coast is generally bordered with sandy beaches; two ranges of hills run parallel with the coast, and on their slopes are several churches.

Pandan bay, formed by a bend in the coast, has considerable depths. The town of Pandan stands at the head of the bay, 15 miles eastward of Pucio point, and 2¼ miles south-eastward of the entrance to Bugan river; it is not visible from seaward. Good anchorage may be obtained by vessels with local knowledge, in depths of from 7 to 10 fathoms ($12^{m}8$ to $18^{m}3$), off Pandan (*Lat. 11° 43′ N., Long. 122° 06′ E.*).

Between Pandan and Lipata point, 15½ miles southward, numerous small rivers discharge, and there are many villages. The coast is generally free from dangers at a distance of half a mile offshore. Lipata point is a low wooded tongue, fringed by a steep-to reef on the northern and southern sides, which extends about half a mile north-westward. The best anchorage in the vicinity during the South-west monsoon is northward of Lipata point, in uneven depths of from 5½ to 23 fathoms ($10^{m}1$ to $42^{m}1$). Lipata village is situated on the point, but is nearly hidden by coconut trees.

Off-lying islands and dangers.—Light.—Sebaste shoal, with a depth of 4 fathoms ($7^{m}3$) over it, lies about 5 miles westward of Sebaste village, situated 7¾ miles southward of Pandan.

Maniguin island, about 13 miles south-westward of Pucio point, has a

Charts 3807, 943, 2661b, 1263.

Chart 3821.

narrow ridge, 110 feet ($33^{m}5$) high across its southern end, but the remainder of the island is low and wooded. It is fringed with steep-to coral reefs. The northern and western points should not be approached within three-quarters of a mile, and the southern point should be given a berth of at least one mile. The eastern side of the island is bold.

Indifferent anchorage may be obtained by vessels with local knowledge, in depths of from 15 to 25 fathoms ($27^{m}4$ to $45^{m}7$), close to the edge of the fringing reef, north-eastward or south-westward of the north-western point of Maniguin island, according to the season; that on the south-western side is the better one.

A light is exhibited, at an elevation of 191 feet ($58^{m}2$), from a circular concrete tower, with dwelling attached, on Maniguin island. *See* view facing page 38.

Batbatan island, 7¼ miles westward of Lipata point, is 550 feet ($167^{m}6$) high; the coasts consist in most places of cliffs, from 20 to 50 feet ($6^{m}1$ to $15^{m}2$) high, interspersed with sandy beaches, where landing may be effected in fine weather. A reef extends a quarter of a mile from the southern side of the island, and shoal water extends a short distance from each end and from a point on the northern side near Batbatan village. At the eastern end of the island there is a small cove protected by a sand spit which extends 1¼ cables southward from the eastern extremity of the island. A small coral islet, 10 feet ($3^{m}0$) high, lies about half a cable southward of the western end of the island. Batbatan island is well cultivated to its summit.

Seco (Seko) islet (*Lat. 11° 19′ N., Long. 121° 40′ E.*) lies about 16 miles south-westward of Batbatan island, and consists of shifting sand hills on a steep-to coral reef. A bank, with a depth of 2 fathoms ($3^{m}7$) over it, extends about one mile north-westward from the islet. A shoal, with a least depth of 19 feet ($5^{m}8$) over it, lies 2 miles north-eastward of Seco islet.

Carmen bank, with a depth of 15 feet ($4^{m}6$) over it, sand and coral, lies about 4¼ miles north-westward of Seco islet. A bank, with a depth of 9 fathoms ($16^{m}5$) over it, lies about 1½ miles southward of Carmen bank, and a shoal, with a depth of 6 fathoms ($11^{m}0$) over it, lies about one mile eastward.

Sultan bank, about 7 miles westward of Carmen bank, consists of two separate shoals, 3¼ miles apart, the eastern of which has a depth of 22 feet ($6^{m}7$) over it, and the western, 7 fathoms ($12^{m}8$).

Charts 3821, 3824.

Maralison island, about 3½ miles south-south-westward of Lipata point, and 1½ miles offshore, is 285 feet ($86^{m}9$) high; with the exception of the flat sandy point at the eastern end it consists of a group of steep small peaks. The usual landing place is behind a sand spit at the eastern end. An islet, 135 feet ($41^{m}1$) high, lies close to the western side and is connected with it by a reef which dries.

A rock, awash, lies about midway between Maralison island and Panay; another rock, awash, lies one mile south-south-eastward of the eastern end of the island. A shoal, with a least depth of 2 fathoms ($3^{m}7$) over it, with 10 fathoms ($18^{m}3$) between it and the island, lies within one mile westward of the western end of Maralison island. A shoal, with a depth of 21 feet ($6^{m}4$) over it, lies about one mile westward of the island.

Coast.—Light.—Between Culasi (Kulasi) village, situated 2¾ miles

Charts 3807, 3809, 943, 2661b, 1263.

southward of Lipata point, and Tibiao point, 8 miles farther southward, the coast is steep and bordered by sand with an occasional narrow coral reef. The town of Tibiao is situated just southward of the point and the river of the same name. About half a mile north-westward of the town of Barbasa, situated about 6 miles southward of Tibiao point, and 3 cables offshore, is a coral reef awash ; a one-fathom ($1^{m}8$) patch lies about three-quarters of a mile north-north-eastward, and another one-fathom ($1^{m}8$) patch half a mile southward of the reef awash, being about 3¼ and 2½ cables, respectively, offshore.

Southward of Ontgol point, situated close southward of Barbasa, the coast continues steep-to and clear of dangers to Dalipe point, about 27 miles south-south-westward. There are several villages on this coast, and Sibalom river discharges through two mouths with a very shallow bar, about 4 miles northward of Dalipe point. Southward of the mouth of the river a bank, with a depth of 9 fathoms ($16^{m}5$) at its outer end, extends one mile offshore, and is steep-to. Dalipe point is low, wooded, steep-to and clear of dangers.

Tubigan point, about 1¾ miles south-eastward of Dalipe point, is low and fringed by a narrow ledge of rocks ; it may be identified by an old fort with a roof standing on the southern part.

A coral reef, with a least depth of 19 feet ($5^{m}8$) over it, and steep-to, lies about three-quarters of a mile south-south-eastward of the old fort on Tubigan point.

A light is exhibited, at an elevation of 50 feet ($15^{m}2$), from a white concrete pillar on the old fort, on Tubigan point (*Lat. 10° 44′ N., Long. 121° 56′ E.*).

San Jose de Buenavista.—Dangers.—Buoy.—San Jose de Buenavista, the capital of Antique province, is situated at the head of a cove eastward of Tubigan point ; it is small and of little commercial importance, and is almost hidden by large trees, only a few galvanised iron roofs being visible. The town is connected to the general telegraph system.

Anchorage may be obtained by vessels with local knowledge, sheltered from north-easterly winds, in depths of from 6 to 7 fathoms ($11^{m}0$ to $12^{m}8$), irregular rocky bottom, off San Jose de Buenavista, with the old fort on Tubigan point bearing 345°. Vessels should not go too close in, as there are several sunken rocks and the bottom is foul.

A black can buoy is moored about 1¼ cables south-south-eastward of the light pillar on Tubigan point, and marks the edge of the shoal extending from the point. There is a pier at San Jose de Buenavista, with a depth, in 1938, of 17 feet ($5^{m}2$) alongside.

A 10-foot ($3^{m}0$) patch and a 9-foot ($2^{m}7$) patch lie about half a cable south-south-eastward of the head of the pier and a quarter of a mile south-eastward of Tubigan point, respectively. A 19-foot ($5^{m}8$) patch lies 6 cables south-south-eastward of the light-structure.

Coast.—Light.—The town of Antique is situated about 3½ miles south-eastward of San Jose de Buenavista, near the mouth of Antique river, and about midway between them Malandoc (Malandok) river, with a depth of 6 feet ($1^{m}8$) on its bar, and 18 feet ($5^{m}5$) inside, discharges. Between the mouth of Malandoc river and Naso point, the south-western extremity of Panay, the coast is very steep, with sandy beaches except at a few points. Jaldan (Haldan) point, about 15½ miles

Charts 3821, 3824.

southward of Dalipe point, is a sharp, bold, rocky point, 90 feet (27^{m}4) high. The rivers, which flow out on this stretch of coast, with the exception of the Malandoc and Antique, have very shallow bars. There are several villages along the coast; the principal one, Dao, about 2 miles north-eastward of Jaldan point, and near the mouth of Dao river, may be identified by a prominent church, with a square tower, covered with galvanised iron.

Naso point lies abreast of a high prominent detached ridge; it may be identified by the town of Aniniy, in which there is a large white stone church with a galvanised iron roof. A small vessel with local knowledge may obtain anchorage during the North-east monsoon eastward of Aniniy, in a depth of 1½ fathoms (2^{m}7), sand.

Nogas islet, about 6 cables south-south-westward of Aniniy, is low, flat, and wooded, and fringed by a reef; between it and the coast of Panay is a narrow channel sometimes used by coasting vessels. In the middle of the north-western entrance is a reef, with a depth of 2½ fathoms (4^{m}6) over it.

A light is exhibited, at an elevation of 85 feet (25^{m}9), from a white steel framework tower, on Nogas islet.

Juraojurao (Huraohurao) islet, about 2¼ miles eastward of Nogas islet, is low, wooded, and fringed by a reef; there is no channel between it and the coast of Panay. It is inadvisable to anchor between Nogas and Juraojurao islets, as the bottom is rocky.

Chart 2391.

ILOILO STRAIT.—Iloilo strait lies between the southern side of Panay and Guimaras island. The town of Iloilo (*Lat. 10° 42′ N., Long. 122° 34′ E.*), on the northern side of the strait, may be approached from seaward through either end of the strait. The description of the strait eastward of Iloilo and directions for approaching through the eastern entrance are given on pages 367-368.

Pilotage.—Pilotage is compulsory for all foreign vessels. Pilotage through Iloilo strait to and from the harbour or for shifting berth is optional for vessels holding Philippine licences, and compulsory for all other vessels. The pilot boat is painted white with the letter P painted on each side of the bow and displays the pilot flag.

It was reported in 1949, that there were 3 pilots who resided at the Customs house, Iloilo. They are available for either entrance.

Tidal streams.—The tidal streams in Iloilo strait run at a maximum rate of from 3 to 4 knots and set in the general direction of the shores. Abreast Iloilo the eddies are strong and irregular with both the north-east and south-west-going streams. The two tides of the day are usually unequal, the inequality varying with the moon's declination.

Charts 2391, 3824.

South-western entrance to Iloilo strait.—Light.—Dangers.—Buoyage.—The southern coast of Panay from Naso point to Talisayan point, about 15 miles north-eastward, is high, steep-to and clear of dangers, thence to the town of Oton, 21 miles east-north-eastward, the coast is low but free from danger until near Oton bank. Cresta de Gallo, a serrated ridge, 799 feet (243^{m}5) high, about 4 miles north-eastward of Naso point, is a prominent mark. From Oton to Iloilo, 5½ miles eastward, the coast continues low and is bordered with coconut trees.

Charts 3809, 943, 1263.

Charts 2391, 3824.

Guimaras island, the north-western side of which forms the south-eastern shore of Iloilo strait, is 825 feet (251^{m}5) high. The western coast is free from dangers. Lusaran point, the western extremity of the island, is bold and prominent; it can easily be identified by the white lighthouse and dwelling on the cliff; it is steep-to.

A light is exhibited, at an elevation of 111 feet (33^{m}8), from a white circular tower, with a white dwelling attached, on Lusaran point. *See* view facing page 38.

Chart 2391.

Igang (Igan) point, about 4 miles north-eastward of Lusaran point, separates Igang bay from Santa Ana bay. Igang bay, on the southern side, is clear of dangers, with depths of from 11 to 13 fathoms (20^{m}1 to 23^{m}8) in the middle, and 2½ fathoms (4^{m}6) at the edge of the bank which fringes the shore.

Santa Ana bay is clear of dangers in the middle, but is only a quarter of a mile wide between the shoals which extend from either side. Anchorage may be obtained by vessels with local knowledge, in depths of from 12 to 14 fathoms (21^{m}9 to 25^{m}6), about 2 cables south-south-eastward of Lawi (Lauy) point, the northern entrance point of the bay, or in a depth of about 7½ fathoms (13^{m}7), in the middle of the bay, about 4½ cables eastward of the same point.

Naburul island, 152 feet (46^{m}3) high, lies close offshore 1¾ miles north-north-westward of Lawi point; it is steep-to and appears from the westward as a high black bluff on Guimaras island, to which it is actually connected by a reef.

Oton bank, of soft muddy sand, extends from three-quarters of a mile south-westward of the mouth of Iloilo river for a distance of about 8 miles south-westward. The least depth is about one foot (0^{m}3), situated about three-quarters of a mile south-westward of the north-eastern end. The bank is reported to be extending westward, and vessels should not attempt to cross it. There is a narrow channel between it and the northern shore of the strait, with a least depth of 3½ fathoms (6^{m}4).

A black can buoy, No. 1, is moored off the southern extremity of Oton bank about 2¼ miles north-westward of Naburul island, and marks the north-western side of the channel through Iloilo strait.

Muhuy point (*Lat. 10° 36′ N., Long. 122° 31′ E.*), 240 feet (73^{m}2) high, and steep-to, lies 2 miles northward of Naburul island. About one mile north-north-eastward of Muhuy point is Cabalic (Kabalik) point, 230 feet (70^{m}1) high, and bold; it is difficult to identify from westward.

A black can buoy, No. 3, is moored on the south-eastern edge of Oton bank, 8½ cables northward of Cabalic point, and marks the western side of the channel.

A shoal, with a depth of 2¾ fathoms (5^{m}0) over it, lies about one mile north-north-eastward of Cabalic point, and about 4½ cables offshore, and a 3¼-fathom (5^{m}9) patch lies about 3¼ cables north-north-westward of this shoal.

Bondulan point, 447 feet (136^{m}2) high, almost vertical, and steep-to, lies 3¾ miles north-eastward of Cabalic point; it is prominent when approaching Iloilo from south-westward. A shoal, with a least depth of 1½ fathoms (2^{m}7) over it, extends from about a quarter of a mile to 1½ miles south-south-westward of the point, and there is a narrow, deep channel between it and the coast of Guimaras.

Charts 3809, 943, 1263.

Chart 2391.

Between Bondulan point and Estampa point, about 3¾ miles north-eastward, there are several bights. At Jordan, a town situated about 1½ miles eastward of Bondulan point, there is a **T**-shaped pier, with four piles, affording a berth, 300 feet (91$^{\text{m}}$4) long, with a least depth of 28 feet (8$^{\text{m}}$5) alongside. Vessels are recommended to berth alongside on the north-east-going tidal stream. At Gimalik point, 1¾ miles east-north-eastward of Bondulan point, there is a pier with a least depth, in 1937, of 26 feet (7$^{\text{m}}$9) at its head. Water is laid on to the pier; there is a crane with a lifting capacity of 5 tons. The south-west-going tidal stream in the fairway has a maximum rate of 4 knots in this vicinity, but alongside the pier there is slack water at that time. Tide-rips occur about one cable south-westward of the pier.

The town of Santo Rosario is situated at the head of the bight, about 1¼ miles south-south-eastward of Estampa point, and from it a channel leads to the town of Buenavista, about half a mile east-south-eastward, which vessels with local knowledge, with a draught not exceeding 9 feet (2$^{\text{m}}$7), can reach. Between Santo Rosario and Estampa point a bank, with depths of less than 3 fathoms (5$^{\text{m}}$5) over it, extends about 3½ cables offshore.

A light-buoy exhibiting a *white flashing* light *every four seconds*, is moored on the western edge of the shoal lying about 1¾ miles south-westward of Bondulan point, and on the eastern side of the channel.

Anchorage.—Directions.—The best anchorage for vessels that cannot enter Iloilo river is north-eastward of its mouth, in a depth of about 15 fathoms (27$^{\text{m}}$4), sand.

A vessel approaching Iloilo from south-westward should steer for Bondulan point, bearing 036°, passing Cabalic point at a distance of about 1¼ cables, and south-eastward of No. 3 black can buoy and the 2¾ fathom (5$^{\text{m}}$0) shoal about 2¼ cables eastward of the buoy; when the twin spires and white dome of the church in Molo, situated about 2¼ miles north-westward of Bondulan point, bears 006°, she should steer for it on that bearing, passing westward of the light-buoy lying about 1¾ miles south-westward of Bondulan point, thence she can steer for the anchorage off Iloilo.

For north-eastern entrance to Iloilo strait, *see* page 367.

Chart 2391, plan of Iloilo river.

Iloilo.—The town of Iloilo (*Lat. 10° 42′ N., Long. 122′ 34′ E.*) stands on a low sandy flat at the mouth of the river of the same name, on the north-western side of Iloilo strait. It is a port of entry and open to foreign shipping. The estimated population, in 1947, was about 80,000.

On either side of the entrance to the river stone jetties extend a short distance into the strait, and there are retaining walls therein. In 1935, there was a dredged channel from the entrance to the town with depths of from 18 to 24 feet (5$^{\text{m}}$5 to 7$^{\text{m}}$3). With the exception of the Railway jetty all the jetties are on the right bank of the river. It was reported, in 1947, that considerable silting had taken place and that only vessels drawing 10 feet (3$^{\text{m}}$0) or less could berth in the river.

For harbour regulations, *see* page 4.

There is a wharf available for vessels up to 500 feet (152$^{\text{m}}$4) in length, with a draught of 28 feet (8$^{\text{m}}$5), about midway between the site of San Pedro fort and the mouth of the river. It is advisable to leave the wharf at half-tide on the north-east-going stream, which

Charts 3809, 943, 1263.

Chart 2391, plan of Iloilo river.

tends to set the vessel off. There is also a berth close north-eastward of this wharf, where there is a dolphin extension, available for a vessel with a draught of 15 feet ($4^{m}6$).

Lights.—A light is exhibited, at an elevation of 15 feet ($4^{m}6$), from a square concrete tower, on each side of the entrance to Iloilo river.

Storm signals.—Storm signals are shown from the new Custom house at Iloilo. *See* page 11. Typhoons are not of frequent occurrence, although few years pass without their effect being felt.

Harbour facilities.—Coal and fuel oil may be obtained. Fruit is plentiful.

Water is supplied to vessels alongside the jetties.

Ordinary repairs to vessels can be effected. There is a patent slip at Iloilo, details of which are given in Appendix I.

There are several tugs and a number of lighters, from 25 to 400 tons capacity.

There is a hospital at Iloilo.

Trade.—The principal exports are sugar and copra; the chief imports are cloth, petroleum, machinery, textiles and flour.

Deratisation.—For deratisation, *see* page 4.

Communication.—**Radio station.**—There is frequent steamer communication with Manila and Zamboanga. Iloilo is connected to the general telegraph system, and by railway with Capiz, on the north coast of Panay.

There is regular communication by air with Davao, Bacolod and Cebu.

There is a radio station at Iloilo (*Lat. 10° 42′ N., Long. 122° 34′ E.*). *See* page 14.

Climatic table.—*See* page 33.

Charts 3816, 3817.

VERDE ISLAND PASSAGE TO JINTOTOLO CHANNEL.—Vessels proceeding by the eastern route from Verde Island passage to Iloilo follow the track of the western route as far as Dumali point (page 320), thence pass eastward of Maestre de Campo island, thence southward of Simara island, and between the islands of Tablas and Romblon, thence through Jintotolo channel.

Dos Hermanas, Banton, and Simara islands, and the northern end of Tablas have been described on pages 327-329.

Chart 3817.

Romblon pass.—**Lights.**—Romblon pass lies between the northern end of Tablas on the west, and Cobrador, Alad, Lugbung, and Romblon islands on the east. It has a least width of about 4¼ miles, and is free from danger.

A light is exhibited, at an elevation of 212 feet ($64^{m}6$), from a white steel framework tower, with a dwelling at the base, on Gorda point, the north-eastern extremity of Tablas island.

Carmen bay, on the southern side of Tablas summit (page 329), the north-eastern promontory of Tablas, affords anchorage open south-eastward to vessels with local knowledge, in a depth of 14 fathoms ($25^{m}6$), mud, with Tablas summit bearing 023°, and Bailan point, about one mile southward of Tablas summit, 074°. Biaringan island, 245 feet ($74^{m}7$) high, lies close southward of the north-eastern entrance

Charts 3807, 3809, 943, 2661b, 1263.

Chart 3817.

point of the bay. A rock, with a depth of 9 feet (2^{m}7) over it, lies half a mile south-eastward of Canapiag (Kanapiag) point, the south-western entrance point of Carmen bay, and a 21-foot (6^{m}4) patch lies about 3 cables southward of Bailan point. A 3-fathom (5^{m}5) patch lies about 3¾ cables from the western shore, west-south-westward of Bailan point.

The coast of Tablas for 5 miles southward of Canapiag point, is fringed by reefs, extending 3 cables offshore in places.

One mile north-north-eastward of Pineda point, situated about 4 miles southward of Canapiag point, is a 6-fathom (11^{m}0) patch, and one mile southward of the point is a shoal, with a depth of 19 feet (5^{m}8) over it. Between these two shoals there are several others with depths of from 33 to 37 feet (10^{m}1 to 11^{m}3) over them.

Cobrador island, 799 feet (243^{m}5) high, and wooded, is steep-to except on its south-western side, from which a reef extends about a quarter of a mile. Cazcarro rocks, 29 feet (8^{m}8) high, and Aregita rocks, 45 feet (13^{m}7) high, lie close off the south-western and eastern sides, respectively of Cobrador island.

Alad island, 700 feet (213^{m}4) high, and wooded, lies about 1¼ miles southward of Cobrador island.

Romblon island, 1,390 feet (433^{m}7) high, is composed chiefly of quartz, marble and slate. On the north-western side between Sabang point, situated about 2½ miles south-south-westward of Tongo point, the northern extremity of the island, and Rosas point, three-quarters of a mile farther southward, is the entrance to Port Romblon, which is described below. Southward of Port Romblon are three bays, the two northern of which are foul, but in the southern one anchorage may be obtained by vessels with local knowledge, in depths of from 6½ to 10 fathoms (11^{m}9 to 18^{m}3), one cable offshore. From the northern entrance point of the latter bay a reef extends 4 cables southward. Between San Pedro point (*Lat. 12° 32′ N., Long. 122° 15′ E.*), the southern entrance point of the bay, and Apunan point, the southern extremity of Romblon, 4 miles south-south-eastward, there are two bights, the northern of which is foul; in the southern bight there is a depth of 5 fathoms (9^{m}1) at a distance of one cable offshore.

A light is exhibited, at an elevation of 97 feet (29^{m}6), from an iron framework tower on a white dwelling, on Apunan point. It was reported, in 1950, that the light was obscured by trees between the bearings of 117° and 133°.

Chart 972, plan of Port Romblon.

Port Romblon and approaches.—Lights.—Lugbung island, fronting the entrance to Port Romblon, lies about three-quarters of a mile southward of Alad island, and has a hill, 300 feet (91^{m}4) high, at each end. It is fringed by a reef, which, from Sasaigan point, the north-eastern extremity, and Nabagbagan point, the south-western extremity, extends about 1¼ and 1¾ cables, respectively.

Tinang islet, consisting of two rocks, about 30 feet (9^{m}1) high, on which there are a few bushes, lies about 2 cables southward of Bombon point, the southern extremity of Alad island, to which it is connected by a reef.

Bangud islet, 175 feet (53^{m}3) high, and wooded, lies about three-quarters of a mile southward of Lugbung island, and is connected to the western side of Romblon by a reef.

Charts 3807, 943, 1263.

Chart 972, plan of Port Romblon.

Port Romblon, on the north-western side of Romblon island, is divided into two parts by Agbatan point.

A light is exhibited, at an elevation of 116 feet ($35^{m}4$), from a white concrete tower, with a white dwelling close southward of it, about 1½ cables north-eastward of the extremity of Sabang point.

A reef, the greater part of which dries, extends about 4 cables south-south-westward from Sabang point. A reef extends about 1¾ cables westward from Agbatan point, and another reef extends about 1¼ cables northward from Binagon point, about 2¼ cables south-eastward of Rosas point. These two last-mentioned reefs are marked at their outer end by a light, each exhibited at an elevation of 15 feet ($4^{m}6$), from a white square concrete beacon.

Anchorages.—Directions.—The northern anchorage, between Sabang and Agbatan points, is well protected from all except south-westerly winds. The southern anchorage off the town of Romblon (*Lat. 12° 35′ N., Long. 122° 16′ E.*), though very confined and deep, affords good protection and is the one generally used. The entrance is only 1¼ cables wide, but the edges of the reefs on either side can generally be distinguished by the discoloration of the water. Anchorage may be obtained in the middle of the southern harbour, in depths of from 14 to 16 fathoms ($25^{m}6$ to $29^{m}3$), mud.

A vessel bound for the southern harbour may approach the entrance to the port by the channels between Romblon and Alad, Alad and Lugbung, or Lugbung and Romblon. She should steer to pass from half to three-quarters of a cable southward of the light-beacon, on the edge of the reef extending westward from Agbatan point, and the same distance northward of the light-beacon on the edge of the reef extending northward from Binagon point; when abeam of the latter she should alter course for the anchorage or for the pier.

In 1949, there was a prominent radio tower on a hill southward of Rosas point.

Romblon.—The town of Romblon, the capital of the province of the same name, is situated on the eastern side of the southern harbour. There are two concrete piers, with a depth of 14 feet ($4^{m}3$) alongside, in front of the town. Water may be obtained alongside.

Storm signals.—Storm signals are shown at Romblon, *see* page **11.**

Chart 3817.

Eastern side of Romblon.—From Apunan point round Sablayan point, the south-eastern extremity of the island, the coast is clear of danger, and steep-to. Northward of Calabago (Kalabago) point, situated on the east coast about midway between Tongo and Apunan points, is a large bight, in which there is an islet, 198 feet ($60^{m}3$) high, situated close northward of the point, with a reef extending half a mile north-north-westward from the islet. The remainder of the north-east and north coasts is clear of danger, and like the whole coast of Romblon, can be approached to a distance of half a mile.

Two 9-fathom ($16^{m}5$) patches lie about 4½ miles eastward and east-south-eastward, respectively, of Calabago point.

Charts 3817, 3821.

Eastern side of Tablas.—The east coast of Tablas between Gorda point and Pineda point is described with Romblon pass on page **339.**

The coast between Pineda point and Tugdan point, 14 miles southward, both of which are low and sandy and difficult to identify, is

Charts 3817, 3821.

distinguished by the spurs extending eastward to the coast from the main mountain range and forming the steep rocky points along the coast.

Chart 3821.

By giving the coast between Tugdan point and Cabalian point, the southern extremity of the island, a berth of 2 miles, all dangers will be avoided.

A reef, which nearly dries, and is steep-to at its outer end, extends 8½ cables north-eastward from Tugdan point. A shoal, with a least depth of 2 fathoms ($3^{m}7$) over it, lies about 1¼ miles south-south-eastward of the same point and one mile offshore. There are several patches, with depths of from 6½ to 9 fathoms ($11^{m}9$ to $16^{m}5$) over them, lying from 1¾ to 2¾ miles southward of Tugdan point and within 1¾ miles of the coast.

Calaton (Kalaton) point, about 8 miles southward of Tugdan point, is the termination of a black, densely wooded promontory, 835 feet ($254^{m}5$) high; it is bordered by steep black cliffs with large rocks at the water line.

Cabahan (Kabahan) island, 277 feet ($84^{m}4$) high, and wooded, lies close offshore, about 2¾ miles north-eastward of Cabalian point (*Lat. 12° 06′ N., Long. 122° 01′ E.*); its southern and eastern sides are formed by red, rocky cliffs, and its northern and western sides are bordered by mangroves. A rocky islet, 42 feet ($12^{m}8$) high, about a quarter of a mile eastward of Cabahan island, is joined to it by a reef, and about a quarter of a mile south-south-eastward of the south-eastern point of Cabahan island is Pez rock, a red pinnacle, 70 feet ($21^{m}3$) high, with deep water between. An islet, 60 feet ($18^{m}3$) high, lies close off the north-western point of the island.

Charts 3817, 3818.

Sibuyan.—The island of Sibuyan is separated from the south-eastern side of Romblon by a passage about 6½ miles wide, and which, except for the two 9-fathom ($16^{m}5$) patches mentioned on page **341**, is very deep. The island is mountainous and has eight distinct peaks. Mount Guitinguitin, 6,750 feet ($2{,}057^{m}4$) high, is situated in the middle of the island; Mount Nailog, 2,619 feet ($798^{m}3$) high, lies about 4 miles west-north-westward of Mount Guitinguitin, with a deep pass, which is well defined, between them and which is often visible when the higher mountains are obscured by clouds. Mount Conico, 2,510 feet ($765^{m}0$) high, 5 miles southward of Mount Guitinguitin, is also a good mark on account of its symmetrical shape. The mountains are covered with forests, and the soil in the lowlands is extremely fertile.

The coast, on which there are many coconut trees and which is fringed by a narrow strip of brushwood, is low. From Ipil point, situated about 3¼ miles north-eastward of Cabodiangan (Kabodiangan) point, the western extremity of the island, round the south and east coasts to Cambulayan (Kambulayan) point, the eastern extremity, the beach is composed of sand and gravel. Mangroves border the remainder of the coast except in a few places, where there are short stretches of sand beach, and coral reefs, which dry, extend from half a cable to 1½ cables offshore

Charts 3817, 3818, 3822.

South-western side of Sibuyan.—Coast.—About 3½ miles south-

Charts 3817, 3818, 3822.

eastward of Cabodiangan point is Bolaboc (Bolabok) point, and 2½ miles farther is the town of España.

Vessels with local knowledge may obtain anchorage off España river, about one mile south-eastward of the town, taking care to avoid the reef and rock, awash, which extend half a mile south-eastward from the southern side of the entrance. Anchorage may also be obtained off the town. The only obstruction in the latter anchorage is a shoal with a depth of 9 feet ($2^{m}7$) over it, lying about half a mile south-westward of the town.

Charts 3818, 3822.

Cantingas (Kantingas) point, 5¾ miles south-south-eastward of España, is low. There are several shoals, with depths of from 13 to 27 feet ($4^{m}0$ to $8^{m}2$) over them, lying north-westward and westward of the point, about three-quarters of a mile offshore, and although there are greater depths inside, vessels should keep at least one mile offshore when navigating in this vicinity. Coral reefs extend from 2 to 2½ cables offshore abreast the town of San Fernando, 2 miles eastward of Cantingas point.

Cauit (Kauit) point (*Lat. 12° 16′ N., Long. 122° 38′ E.*), the southern extremity of Sibuyan, is a low and flat tongue of coarse sand and gravel; the extremity of the point is steep-to, but heavy tide-rips occur at and near spring tides. The town of Azagra is situated half a mile northward of the point.

Off-lying danger.—Prueba reef, on which there are two heads which dry, lying about 1½ miles southward of Cauit point, extends from one to 3 miles southward, with a 2-fathom ($3^{m}7$) patch at the outer end.

Charts 3818, 3817.

Northern side of Subuyan.—Dangers.—The northern coast of Sibuyan is fringed in many places with a wide coral reef. Between Ipil point and the town of Magallanes, about 3½ miles east-north-eastward, the coast is fringed with coral and mangroves, and the coastal bank extends about 3 cables offshore. A 3-fathom ($5^{m}5$) patch lies about half a mile north-eastward of Cangouac (Kangouak) point, situated 2 miles north-eastward of Ipil point. Magallanes stands on the western bank of the river of the same name. On the eastern side of the river is a large house with a white roof, which is a good mark for approaching the anchorage off the town.

Chart 3818.

A coral reef and shoal, with a depth of 3 feet ($0^{m}9$) over it, extends half a mile north-eastward from Consumala (Konsumala) point, the northern extremity of the island. The coastal bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends the same distance northward and westward of the point. About 3¼ miles eastward of Consumala point is Silom village, off which there is a break in the coastal reef which affords anchorage and some protection, to small vessels with local knowledge.

Off-lying shoals.—There is a rock, awash, northward of the town of Magallanes, about 1½ miles north-north-westward of the house with a white roof; shoals extend half a mile north-westward and southward from the rock, with depths of 18 and 16 feet ($5^{m}5$ and $4^{m}9$) over the outer ones, respectively. A shoal, with a depth of one fathom ($1^{m}8$) over it, lies about 2 miles north-north-westward of Consumala point.

Charts 3807, 943, 1263.

Charts 3818, 3817.

Anchorage.—Directions.—Anchorage may be obtained by vessels, with local knowledge, in depths of from 6 to 9 fathoms (11^{m}0 to 16^{m}5), sand, north-westward of the entrance to Magallanes river.

The anchorage off Magallanes may be approached either from north-westward or north-eastward. From northward and westward, when about 2 miles northward of Cangouac point, a vessel should steer for the large house with a white roof, on the east bank of the Magallanes river, bearing 149°, which course will lead to the anchorage.

A vessel from eastward should keep from 1½ to 2 miles offshore until Ipil point bears 245°, when she may steer for it on this bearing, but it passes over a 33-foot (10^{m}1) patch, about 1¼ miles northward of Consumala point; when the mouth of the river bears 186°, she should alter course to 197° to avoid the 16-foot (4^{m}9) patch mentioned above; the last course will lead to the anchorage north-westward of the entrance to the river. Ipil point (*Lat. 12° 29′ N., Long. 122° 28′ E.*), which is about 70 feet (21^{m}3) high, is prominent only on the above bearing.

Chart 3818.

Eastern side of Sibuyan.—Dangers.—Between Canloay (Kanloai) point, situated about 5½ miles eastward of Consumala point, and Cambulayan (Kambulayan) point, the eastern extremity of the island, the coast is fringed with coral and mangroves, but there are a few stretches of sand and gravel beach where a landing can be made.

There is a chain of shoals of sand and stones lying from one to 1½ miles off the north-eastern coast, with a deep channel between them and the coast. The southern end of the chain lies about one mile northward of Cambulayan point and it extends about 6½ miles north-north-westward. There are several breaks or passages into the channel, the most important of which lies opposite Cambalo (Kambalo) point and town, 4¼ miles north-north-westward of Cambulayan point. A rock, awash, lying 1½ miles north-eastward of Canloay point, marks the northern shoal. The north-western part of this channel should not be used by vessels without local knowledge when proceeding to Cambalo, as it is narrow, and long and extensive reefs extend offshore. The outer edge of the chain of shoals is steep-to.

Charts 3818, 3822.

Between Cambulayan point and Cauit point, the coast is clear of dangers and steep-to outside a distance of 3 cables. The town of Cajidiocan (Kajidiokan) stands about 2 miles south-south-westward of Cambulayan point. A rock, with a depth of 3 feet (0^{m}9) over it, lies one cable offshore, about 4½ cables north-north-eastward of Cauit point.

Radio station.—There is a radio station at Cajidiocan. *See* page 14.

Channel between Sibuyan and Masbate.—Dangers.—The channel between Sibuyan and the western side of Masbate is 32 miles wide and is encumbered by numerous shoals and reefs which are steep-to. The channel may be approximately divided into three main passages, of which the western is the easiest to navigate. This passage lies between the south-eastern side of Sibuyan and Prueba reef on the north-west, and a line of reefs lying about 6 miles south-eastward of Sibuyan, on the south-east. The narrowest part of this passage, between Prueba reef and Cresta de Gallo island, is about 3½ miles

Charts 3807, 943, 1263.

Charts 3818, 3822.

wide, deep, and clear of dangers. The other passages should not be used on account of the irregular tidal streams.

Cervera reef, the eastern end of which is awash, lies about 9 miles east-south-eastward of Cambulayan point, Sibuyan. Perseus reef, with a depth of 1½ feet ($0^{m}5$) over it, and Roda reef, with a depth of 2 fathoms ($3^{m}7$) over it, lie about 5 and 6¾ miles, respectively, south-westward of Cervera reef.

Chart 3822.

Aubarede reef, with a depth of 10 feet ($3^{m}0$) over it, lies about 6 miles south-eastward of Cauit point.

Cresta de Gallo island, 5½ miles south-south-eastward of Cauit point, has two peaks in the southern part, the northern and higher one having an elevation of 94 feet ($28^{m}7$), and is a good mark. The northern part of the island is a low sand spit almost awash at very high tides. A coral reef, which dries, extends three-quarters of a mile north-eastward, and shoal water extends the same distance eastward and westward from the island. There is a depth of 27 feet ($8^{m}2$) about 3 miles south-south-westward of the island, with depths of from 2½ to 10 fathoms ($4^{m}6$ to $18^{m}3$) between.

Romero reef (*Lat. 12° 10′ N., Long. 122° 43′ E.*), with a depth of 15 feet ($4^{m}6$) over it, sand and rock, lies about 2 miles south-eastward of Cresta de Gallo island, with considerable depths between.

Between the group of reefs described above and those south-eastward of it, described below, there is a deep channel.

Chart 3818.

Bennet reef, on which there is a shifting sand cay, lies about 7½ miles west-south-westward of Gato island (page 346).

Charts 3818, 3822.

Gamma reef, with a depth of 3 fathoms ($5^{m}5$) over it, lies 3¾ miles south-eastward of Bennet reef.

Montero shoal, with a depth of 1½ feet ($0^{m}5$) over it, lies about 7 miles south-south-westward of Bennet reef.

Chart 3822.

Lying within 13 miles south-westward of Montero shoal are:— Roldan reef, with a depth of about 4 feet ($1^{m}2$) over it; Anda reef, with a depth of 7 feet ($2^{m}1$); Carrasco reef, with a depth of 15 feet ($4^{m}6$); Pineda and Arana reefs, each with a depth of 3 feet ($0^{m}9$); and Reynoso reef, with a depth of 16 feet ($4^{m}9$), the positions of which can best be seen on the chart. A 2-fathom ($3^{m}7$) patch lies about 2¼ miles westward of Anda reef.

Charts 3807, 3808.

Masbate.—The island of Masbate is mountainous, there being a central chain which follows a semi-circular direction and terminates at the south-western and south-eastern points of the island, throwing out spurs north-westward which terminate in Bugui point, the northern extremity. The highest point of the island is situated 19 miles south-eastward of Bugui point, where there is an elevation of 2,285 feet ($696^{m}5$). The island is well wooded and watered, and in the south-eastern part there are extensive grazing lands. The island is sparsely inhabited; the towns are small and of little commercial importance.

Chart 3818.

Western side of Masbate.—Coast.—Light.—Dangers.—Bugui

Charts 3807, 943, 1263.

Chart 3818.

point is moderately high and steep-to, and may be passed close-to in depths of from 6 to 7 fathoms ($11^{m}0$ to $12^{m}8$).

A light is exhibited, at an elevation of 218 feet ($66^{m}4$), from a white circular masonry tower, attached to a grey dwelling with a red roof, situated about one cable within the extremity of Bugui point.

The coast between Bugui point and Bagupantao point, 9 miles southward, is moderately high and steep-to as far southward as the village of Mataba, 3¾ miles southward of Bugui point. At Mataba, a bank extends offshore with several dangerous shoals on it, the outermost with a depth of 9 feet ($2^{m}7$) over it, lying about 1½ miles south-south-westward of the village and one mile offshore. Vessels should not venture amongst these shoals.

Off-lying island and dangers.—Beta reef, with a depth of 9 feet ($2^{m}7$) over it, and steep-to, lies 6½ miles south-south-westward of Bugui point and about 3½ miles offshore.

Gato island, about 2¾ miles west-south-westward of Bagupantao point, lies on the outer edge of the bank extending from the western side of Masbate, and is 188 feet ($57^{m}3$) high. A shoal, with a depth of 3 fathoms ($5^{m}5$) over it, lies about 2½ miles northward of Gato island, with other depths of less than 5 fathoms ($9^{m}1$) between, and a shoal, with a least depth of 33 feet ($10^{m}1$) over it, lies about 2 miles southward of the island.

Charts 3818, 3822.

Coast.—Between Bagupantao point (*Lat. 12° 28′ N., Long. 123° 15′ E.*) and Mariveles point, about 13 miles southward, the coast is lower than it is northward, and is indented by several bays fronted by the islands of Majaba (Mahaba), 72 feet ($21^{m}9$) high, Nabugtut, and Napayauan, 110 feet ($33^{m}5$) high, the positions of which can best be seen on the chart. The passage between these islands and the coast of Masbate is encumbered with coral heads which dry. Two reefs south-eastward of the southern extremity of Napayauan island almost close the approach to the anchorage between that island and the coast of Masbate. About 1¼ miles south-westward of the southern point of Napayauan island, is the outer end of a coral shoal which extends about 2¼ miles north-westward from the coast of Masbate; it has depths of from 6 to 16 feet ($1^{m}8$ to $4^{m}9$) over it, with a coral reef one mile long, and several rocks, awash, at its inner end.

Tumalaytay island, 214 feet ($65^{m}2$) high, lies on the edge of the coastal reef, west-north-westward of the point of the same name, situated about 2½ miles northward of Mariveles point. A 25-foot ($7^{m}6$) patch lies about 1¼ miles north-north-westward of Tumalaytay island.

Anchorages.—A sheltered anchorage may be obtained northward of Majaba island, in depths of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$), mud. The approach is contracted by a 9-foot ($2^{m}7$) patch lying 4 cables southward of Bagupantao point, and by a 10-foot ($3^{m}0$) patch lying the same distance north-westward of the northern point of Majaba island. The channel between these two shoals is about a quarter of a mile wide, with a depth of 7 fathoms ($12^{m}8$) in the fairway.

Good anchorage may be obtained south-eastward of Majaba island, in depths of from 4 to 5 fathoms ($7^{m}3$ to $9^{m}1$), sand, by passing between Majaba and Nabugtut islands.

Anchorage may be obtained by small craft eastward of the southern part of Napayauan island, in a depth of 4 fathoms ($7^{m}3$), mud, by

Charts 943, 1263.

Charts 3818, 3822.

passing between the eastern reef, situated south-eastward of the southern point of the island, and the coast of Masbate; this channel is 2 cables wide.

Off-lying dangers.—Tuma reef, with a depth of 16 feet ($4^{m}9$) over it, lies about 6 miles westward of Mariveles point. Between this reef and Pagbulungan point, situated 1½ miles south-south-eastward of Mariveles point, are several patches, with depths of from 5 to 7 fathoms ($9^{m}1$ to $12^{m}8$) over them.

Chart 962, plan of Nin and Look bays.

Nin bay.—Dangers.—Nin bay, entered between Pagbulungan point and Talisay point, about 5 miles southward, is divided into two parts by Camasusu and Carogo islands. The northern part, or Nin bay proper, is safe and well sheltered, with good holding ground.

Camasusu (Kamasusu) island, 504 feet ($153^{m}6$) high, and wooded, is steep-to on all sides; there is a deep channel about 1½ cables wide between it and Cabacujan (Kabakuhan) point, the western extremity of Carogo island. Carogo (Karogo) island is 510 feet ($155^{m}4$) high, and wooded.

Chart 3822.

About 4 miles west-north-westward of Camasusu island there is a 4-fathom ($7^{m}3$) patch, and about midway between them is a shoal, with a least depth of 19 feet ($5^{m}8$) over it. A 5-fathom ($9^{m}1$) patch lies about 4 miles westward of Camasusu island.

Chart 962, plan of Nin and Look bays.

Argos reef, with a depth of 19 feet ($5^{m}8$) over it, and Romulus reef, with a depth of 9 feet ($2^{m}7$) over it; lie about 1¼ miles southward and south-south-eastward, respectively, of Pagbulungan point. The channel between these reefs and the point is clear of dangers, but that between the reefs and Carogo island is encumbered with Ochoa reef, with a depth of 7 feet ($2^{m}1$) over it, Sostoa bank, with a depth of 15 feet ($4^{m}6$) over it; Ponte rock (*Lat. 12° 12′ N., Long. 123° 15′ E.*), with a depth of one foot ($0^{m}3$) over it; Pearl rock, awash, and several other shoals, the positions of which may best be seen on the chart.

A well protected anchorage may be obtained by small craft in the entrance to the channel connecting the head of Nin bay with Alas bay. Mandaon village, situated on the peninsula separating the two bays, is of no commercial importance.

Looc (Look) bay, the south-eastern part of Nin bay, is shallow in its eastern part, as is also the narrow channel leading into it between the north-eastern end of Carogo island and Masbate.

Tandao rock, awash, lying three-quarters of a mile north-north-westward of Talisay point, is the only danger in the entrance to Looc bay, but coral reefs, some of which dry, and shoals extend from about 1½ to 6½ cables from the southern side of the bay.

A good anchorage may be obtained eastward of the summit of Camasusu island, in depths of from 5 to 6 fathoms ($9^{m}1$ to $11^{m}0$).

Chart 3822.

Coast.—Between Talisay point and Pulanduta point, the south-western extremity of Masbate, the coast is low except at Tumatum point, situated 11 miles south-south-westward of Talisay point, where the hills approach close to the coast and form low, rocky bluffs. Tumatum point rises steeply to a hill, 470 feet ($143^{m}3$) high. Coral reefs and sand beach fringe the coast.

Charts 3807, 3808, 943, 1263.

Chart 3822.

Off-lying shoals.—A shoal, with a depth of 21 feet ($6^{m}4$) over it, lies 6 miles westward of Talisay point. A 4-fathom ($7^{m}3$) patch lies 8½ miles south-westward of the same point and 5½ miles offshore. About 1¾ miles north-eastward of this patch is a shoal, with a depth of 31 feet ($9^{m}4$) over it. A 6-fathom ($11^{m}0$) patch lies 9 miles south-south-westward of Talisay point and 2½ miles offshore.

Jintotolo island.—Jintotolo island, which lies 3 miles south-south-westward of Pulanduta point, is described with Jintotolo channel on page 354.

Chart 3808.

Asid gulf.—Asid gulf lies on the southern side of Masbate between Pulanduta point and Caduruan (Kaduruan) point, the south-eastern extremity of the island, about 54 miles east-south-eastward. The greater part of the gulf is encumbered with islets and shoals. Vessels, unless possessing local knowledge, should not attempt to enter the gulf. The town of Milagros stands at the head of the gulf.

Chart 3822.

Anchorage may be obtained by vessels with local knowledge, in a depth of 5½ fathoms ($10^{m}1$) sand, eastward of Pulanduta point, but care should be taken to avoid a shoal, with a depth of 21 feet ($6^{m}4$) over it, which lies 3¼ miles east-north-eastward of the point, and about 1½ miles offshore.

Between Pulanduta point (*Lat. 11° 54′ N., Long. 123° 10′ E.*) and a point 20 miles north-eastward, the western shore of Asid gulf is steep-to and fringed by a narrow coral reef, with sand beaches in places. Moderately high land, covered with trees, comes close to the water's edge as far as Jangan (Hangan) point, 10½ miles north-eastward of Pulanduta point. Northward of this point the hills recede from the coast and give place to a low, grass-covered plain through which flow numerous small rivers.

Charts 3822, 3823.

A coral reef, which dries, lies three-quarters of a mile off the mouth of the Bangad river, which discharges about 11 miles north-north-eastward of Jangan point; there is shoal water between the reef and the shore. From this reef to the head of the gulf and along the eastern shore to the town of Placer, about 12½ miles north-westward of Caduruan point, the coastal bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends from about half a mile to 4 miles offshore. The shore is mostly a sandy beach, bordered with trees fronting a grassy plain, and is devoid of prominent landmarks. Vigia hill, 330 feet ($100^{m}6$) high, lying about 1½ miles north-eastward of Buri point, situated 24 miles north-westward of Caduruan point, is the most prominent mark. Balabao point, 11 miles north-westward of Buri point, though projecting from the general direction of the coast, is not noticeable from offshore, and the islands in the gulf are low and covered with bushes.

Lying about 2½ miles off the north-eastern shore and 10½ miles north-westward of Caduruan point is Guinauayan island, 212 feet ($64^{m}6$) high, thence north-westward are Nagarao, Nabugtu, Naro, Chico, Guinlabagan, Guilutugan, Pobre, Namatian, Manoc (Manok), and Guinluthagan islands. About 4½ miles from the head of the gulf is Naguran island. There are numerous shoals, one of the outer and most dangerous being Gorriti shoal, over which there is a depth of

Charts 3807, 3808, 943, 1263.

Charts 3822, 3823.

3 feet (0$^{\text{m}}$9), lying 4½ miles south-south-westward of Naro island. The position of these islands and shoals may best be seen on the charts.

Caduruan point consists of rocky bluffs separated by short stretches of sand beach. Within the point the hills rise to an elevation of about 300 feet (91$^{\text{m}}$4), but have no prominent peaks ; they are covered with trees and brushwood with occasional clearings near the coast. The coastal bank extends about a quarter of a mile southward from the point, close outside of which there is a depth of 5 fathoms (9$^{\text{m}}$1).

The east coast of Masbate northward of Caduruan point is described on page 401.

Charts 3821, 3822.

NORTHERN SIDE OF PANAY.—Coast.—Between Potol point (page 332) and Bulacaue (Bulakaue) point, the north-eastern extremity of Panay, about 75 miles east-south-eastward, the coast is generally low and bordered by sand. Between Potol point and Saboncogon (Sabonkogon) point, about 3¼ miles south-eastward, a coral reef extends about a quarter of a mile offshore. Saboncogon point rises steeply to a hill, 325 feet (99$^{\text{m}}$1) high, a quarter of a mile south-westward and can be closely approached; between it and Ibajay (Ibahai) point, about 11 miles east-south-eastward, the coast is steep and clear of dangers.

Chart 3822.

Ibajay point is flat and sandy, and on it is the town of the same name. Vessels with local knowledge may obtain a sheltered anchorage from southerly winds north-eastward of the town, but during the South-west monsoon the wind often shifts suddenly to the north-westward, and Pontud banks (*see* below) would then be to leeward, and a large vessel could not remain here with safety.

The town of Ibajay is connected to the general telegraph system.

About one mile east-south-eastward of Ibajay (*Lat. 11° 50′ N., Long. 122° 10′ E.*) is Colongcolong village with a concrete pier, which had, in 1938, a depth of 10 feet (3$^{\text{m}}$0) alongside.

Sigat point, about 3½ miles east-south-eastward of Ibajay point, and Apga point, 2½ miles farther, are both high, and fringed by reefs which extend one cable offshore, with a depth of 8 fathoms (14$^{\text{m}}$6) at their edges. Between these points there is a small bay, open northward, and fronted by Pontud banks.

Pontud banks consist of several shoals, with depths of from about one to 16 feet (0$^{\text{m}}$3 to 4$^{\text{m}}$9) over them, lying from 1½ to 3½ miles northward of Apga point. A shoal, with a depth of 2 fathoms (3$^{\text{m}}$7) over it, lies half a mile north-north-westward of Apga point, and a one-fathom (1$^{\text{m}}$8) patch lies 5 miles north-north-westward of the same point. The channel between the latter shoal and the northern shoal of the Pontud banks is 1½ miles wide, with considerable depths between. The channel between the southern end of the banks and the 2-fathom (3$^{\text{m}}$7) patch off Apga point is three-quarters of a mile wide.

Aclan (Aklan) point, 7½ miles east-south-eastward of Apga point, is flat and formed by deposits from the river of the same name which flows out at the point. On the bar there is ordinarily a depth of 5 feet (1$^{\text{m}}$5), and with fresh north-easterly winds the sea breaks heavily on it. Kalibo, one of the most important towns in the province of

Charts 3807, 943, 1263.

Chart 3822.

Capiz, is situated on the eastern bank of Aclan river, about 2 miles from its mouth, but vessels are unable to reach it.

Charts 1622, plan of Port Batan, 3822.

Port Batan.—Light.—Buoys.—Port Batan, entered between Floripon point, about 11 miles south-eastward of Aclan point, and Batan point, three-quarters of a mile southward of Floripon point, may be identified by Pilot mount, a prominent peak, 867 feet ($264^{m}3$) high, about 5 miles southward of Floripon point. Ocboc hill, a prominent, steep, rocky mound, 154 feet ($46^{m}9$) high, lies close to the coast, about 2½ miles south-eastward of the same point. Floripon point is densely wooded and steep-to on its eastern side. A bank, with a depth of less than 3 fathoms ($5^{m}5$) over it, sand, extends 1½ and 2 miles northward from the western and eastern sides, respectively, of the entrance to the port, leaving a channel leading into the port a quarter of a mile wide between them. In 1938, there was a least depth of 4 fathoms ($7^{m}3$) on the bar, but it is liable, as well as the shoals extending from the entrance points, to shift after freshets. If the channel buoys are out of position, the edges of the banks may be distinguished by the colour of the water, and at times by tide-rips. The tidal streams run at a considerable rate in this vicinity.

The village of Batan, on the eastern shore of the port, is in ruins, and only a few native huts are visible.

A light (*Lat. 11° 37′ N., Long. 122° 29′ E.*) is exhibited, at an elevation of 39 feet ($11^{m}9$), from a white circular tower, on Floripon point.

The channel into Port Batan is marked on its western side by two red conical buoys, Nos. 2 and 4, and on its eastern side by a black can buoy, No. 1.

The entrance to Lagatic (Lagatik) river, which flows into the northern part of Port Batan, is marked by a red conical buoy and a black can buoy. Vessels should pass close northward of the black buoy.

Chart 3822.

New Washington is situated about 3½ miles above the mouth of Lagatic river. There are several warehouses and two wharves here. It is reported that a depth of 10½ feet ($3^{m}2$) can be carried from Port Batan to the wharves. There is regular communication by steamer between New Washington and Manila, and with Iloilo and intermediate ports.

Chart 1622, plan of Port Batan.

Anchorage.—Directions.—Anchorage may be obtained anywhere southward of the peninsula which forms the northern side of Port Batan. A vessel bound into the port should steer for the lighthouse, bearing 195°, and then pass between the buoys and allowing for the tidal stream. The southern part of Floripon point should be rounded at a distance of 1¼ cables, and an anchorage taken up as required.

Chart 3822.

Good anchorage may be obtained by vessels with local knowledge during the South-west monsoon outside the peninsula on which New Washington is situated. The peninsula at this point is less than a quarter of a mile wide.

Off-lying shoals.—A coral shoal, with a depth of 4 fathoms ($7^{m}3$) over it, lies about 5¾ miles north-north-eastward of the lighthouse on Floripon point and a 5-fathom ($9^{m}1$) patch lies half a mile south-westward of the shoal.

Charts 3807, 943, 1263.

Chart 3822.

A coral shoal, with a least depth of one-fathom ($1^{m}8$) over it, and a 31-foot ($9^{m}4$) patch close westward of it, lie about 2¾ miles northward of Baquiao (Bakiao) point, situated about 5 miles south-eastward of Batan point. About 1¼ miles northward of Baquiao point is another coral shoal, with a depth of 16 feet ($4^{m}9$) over it; between this shoal and the point the ground is foul.

Coast.—Sapian bay, entered between Baquiao point and Nailon point, about 4¼ miles eastward, is clear of dangers, but a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends about 2 miles from the head. It is protected from all winds except from northward. Malacha islet, 50 feet ($15^{m}2$) high, lies about 2¼ miles south-south-westward of Nailon point. Sapian peninsula, which forms the eastern shore of the bay, terminates in two points, 1¼ miles apart, Marancalan (Marankalan) point south-westward, and Nailon point north-eastward.

Mabay (Mabai) islet, about one mile northward of Marancalan point, is a rocky islet, partially wooded, and 75 feet ($22^{m}9$) high, and Mabahang islet, 20 feet ($6^{m}1$) high, lies about half a mile north-westward of the same point. About half a mile north-westward of Mabay islet is a shoal, with a least depth of 9 feet ($2^{m}7$) over it; there is a depth of 5 fathoms ($9^{m}1$) between this shoal and the shoal water extending from the islet. An islet, 65 feet ($19^{m}8$) high, lies about 4 cables westward of Marancalan point; these rocky islets have some trees on them.

Tuad islet, 1¼ miles north-eastward of Nailon point, is 44 feet ($13^{m}4$) high and partially wooded; it lies near the northern part of a bank of sand and coral heads, which extends about 4 cables southward. A coral shoal, with a depth of 2 fathoms ($3^{m}7$) over it and 5 fathoms ($9^{m}1$) around it, lies three-quarters of a mile eastward of Tuad islet.

Capiz bay.—**Lights.**—Capiz (Kapiz) bay is entered between Nailon point and Culasi (Kulasi) point, about 4 miles north-eastward. Panay river, one of the most important rivers in the island, discharges about 1½ miles southward of Culasi point (*Lat. 11° 37′ N., Long. 122° 42′ E.*), and several other streams flow into the bay. The headland which forms the northern side of the entrance to Panay river, is high and well wooded and has on its summit a prominent old fort, at an elevation of 125 feet ($38^{m}1$). The bar at the mouth of the river is constantly changing. Culasi point is 222 feet ($67^{m}7$) high, wooded and steep. A pinnacle rock, with a depth of 8 feet ($2^{m}4$) over it, lies about a quarter of a mile south-westward of the lighthouse. Southward of the point is Libas cove, on the southern side of which are Libas village and a pier, with a depth of 8 feet ($2^{m}4$) off it, sheltered by two breakwaters at the entrance to the cove. The northern breakwater extends in a southerly direction from Culasi point, and the southern breakwater extends in a west-north-westerly direction from the southern entrance point of the cove, leaving an entrance between them, about 120 yards ($36^{m}6$) wide.

A light is exhibited, at an elevation of 157 feet ($47^{m}8$), from a concrete structure, on Culasi point.

Two lights are exhibited, at an elevation of 20 feet ($6^{m}1$), from white square concrete towers, one on each head of the breakwaters at Libas cove.

Capiz (Kapiz), the capital of the province of the same name, is situated on the northern bank of Panay river, about 3 miles from the

Charts 3807, 943, 1263.

entrance. It is connected with Iloilo by a railway and there is occasional communication by steamer with Manila and Iloilo.

A vessel with local knowledge, with a draught of 18 feet (5^m5), can reach the concrete pier at Culasi village, alongside which, in 1939, there was a depth of 17 feet (5^m2).

Anchorage.—Vessels with local knowledge unable to cross the bar of Panay river or go to the pier in Libas cove, may obtain anchorage about one mile south-westward of Culasi point, in a depth of 3½ fathoms (6^m4), mud, or closer in if their draught permits.

Coast.—Dangers.—Nipa point, 90 feet (27^m4) high, steep and rocky, lies about three-quarters of a mile north-eastward of Culasi point, and between them is a cove with a sandy beach and large coconut groves at either end. Culasi hill, half a mile southward of Nipa point, is 340 feet (103^m6) high ; it slopes to the water's edge at the head of the cove.

A rock, with a depth of about 5 feet (1^m5) over it, lies half a mile west-north-westward of Nipa point, and Flat rock, about one foot (0^m3) high, and surrounded by rocks awash, lies about half a mile northward of the same point. About midway between Flat rock and the coast are some other rocks, which dry about 5 feet (1^m5).

Between Nipa point and Pirara point, 7 miles eastward, the coast is flat with long sand beaches bordered with coconut trees and native huts. About 2 miles eastward of Nipa point is a cable hut, a low brick building situated close to the beach. Mantalinga islet, 75 feet (22^m9) high, and wooded, lies about 1¾ miles eastward of Nipa point. The channel between the islet and the coast of Panay is half a mile wide, with a depth of 19 feet (5^m8), but the islet is too small to afford a protected anchorage. Nagtig islet, about one mile north-north-westward of Pirara point and 3¼ cables offshore, is densely covered with brushwood and trees, the tops of which have an elevation of 82 feet (25^m0). A small group of rocks which are above water, lie about half a cable north-eastward of Nagtig islet.

Pirara point (*Lat. 11° 36′ N., Long. 122° 50′ E.*) is low, sandy, and covered with bushes and coconut trees. Palapag river, which flows out close southward of the point, forms a shallow sand bar which extends three-quarters of a mile seaward.

Off-lying island.—Olutaya island, 372 feet (113^m4) high, and sparsely wooded, lies about 1¾ miles northward of Pirara point, with a deep and clear channel about 6 cables wide, between. Three wooded islets lie off the island, one off the northern side, 62 feet (18^m9) high, one off the western side, 49 feet (14^m9) high, and one off the south-eastern side ; the latter is connected to the island by a reef, which dries about 3 feet (0^m9). There is a small bay on the south-eastern side of the island which affords good anchorage for small vessels with local knowledge.

Pilar bay.—Pilar bay, entered between Pirara point and Bulacaue point, 19 miles eastward, contains no sheltered anchorage and is of little value to navigation. The head of the bay is shallow, but there are no detached dangers except Tucat (Tukat) reef.

From Pirara point to Buncayao (Bunkayao) point, the western entrance point of Tinagongdaget inlet, and 8 miles south-eastward, the shores are low and sandy with stretches of mangroves. From Pinamijagon (Pinamihagon) point, the eastern entrance point of the inlet,

Chart 3822.

to the town of Pilar, 4½ miles eastward, mangroves line the shore for the first half of the distance, followed by a sand beach fringed with shoals and coconut trees to Pilar. About three-quarters of a mile east-south-eastward of Pilar is a very prominent limestone cliff, 400 feet ($121^{m}9$) high, visible from the entrance to the bay. Banogay (Banogai) islet, low, and wooded, lies one mile north-eastward of Pilar and three-quarters of a cable from the shore, with which it is connected by a sand bar which dries. From Pilar to Bulacaue point, the shore is sandy with some stretches of rock. On this coast there are several small villages. Between Carles village, about 2 miles south-westward of Bulacaue point, and the point are two small prominent hills. The south-western, 1½ miles from the point, is 183 feet ($55^{m}8$) high and wooded; the north-eastern hill, half the above distance from the point, is 163 feet ($49^{m}7$) high and covered with grass.

Tinagongdaget inlet is the common mouth of several small streams. It is entirely fringed with mangrove except at the end of Manapao point, which projects into the middle of the inlet, 3¾ miles south-south-westward of Buncayao point. This point is rocky and covered with coconut trees, and when entering the inlet it appears to be an islet. On the bar off the entrance to the inlet there is a depth of 1½ fathoms ($2^{m}7$), increasing to 6 and 8 fathoms ($11^{m}0$ and $14^{m}6$) inside. The inlet affords good shelter for small vessels with local knowledge. Nasunda islet, near the head of the inlet, is covered with mangroves.

Tucat reef, about 3 miles northward of Banogay islet, consists of sand and coral, and dries at very low tides. It is not easily distinguished by the colour of the water, as in Pilar bay it is more or less muddy. Vessels bound into Tinagongdaget inlet should pass westward of the reef by keeping the limestone cliff eastward of Pilar bearing 175° and open westward of Banogay islet.

Bulacaue point (*Lat. 11° 36′ N., Long. 123° 09′ E.*), the north-eastern extremity of Panay, is a spur from Mounts Agudo and Sibala, situated about 15 and 12 miles, respectively, south-westward of the point. The point is low and terminates in a sand spit with rocks at the end which extend about 3½ cables and dry.

Chart 3807.

Tidal streams.—Along the north coast of Panay the east-going stream enters by the passages between Panay and Tablas and sets thence through Jintotolo channel into the Visayan sea. At the same time the stream sets northward along both sides of Tablas and south-eastward along the south-western side of Sibuyan, and south-westward in the vicinity of Cresta de Gallo island. During the west-going stream along the north coast of Panay the streams in the above-mentioned localities set in the opposite directions to those stated above.

Between Panay and Tablas the tidal streams may attain a rate of 3½ knots, but elsewhere do not exceed 2 knots.

Chart 3822.

There are eddies and irregular tidal streams around Olutaya island, and slight tide-rips have been observed just westward of the passage between Olutaya island and Nagtig islet when the tidal stream was running at its full strength.

JINTOTOLO CHANNEL.—Islands and dangers.—Lights.—

Charts 3808, 943, 1263.

Chart 3822.

Jintotolo (Hintotolo) channel is the passage between Panay and Masbate, and is divided into three passages by Jintotolo (Hintotolo) island and the Zapato islands; that between Jintotolo island and the Zapato islands is generally used.

Zapato islands are three small islands lying on a bank, composed mostly of coarse white sand, lying about 12 miles north-westward of Bulacaue point. Zapato Mayor, the north-eastern and largest of the group, is 187 feet (57^{m}0) high and sparsely wooded, and is fringed by a reef on its western and southern sides; it is inhabited and well cultivated. Zapato Menor, 3¼ miles south-westward of Zapato Mayor, is 171 feet (52^{m}1) high, well wooded, steep-to and clear of dangers. Chinela islet, about one mile north-north-eastward of Zapato Menor, is 47 feet (14^{m}3) high, rocky, and covered with brushwood; it is fringed by a rocky ledge, which dries about 3 feet (0^{m}9), extending about a quarter of a cable from it.

Elcano shoal, with a least depth of 8 fathoms (14^{m}6) over it, lies about 9½ miles north-westward of Zapato Mayor island.

Jintotolo island, 3 miles south-south-westward of Pulanduta point, the south-western extremity of Masbate, is 130 feet (39^{m}6) high, well wooded, and bordered by a sandy beach; it is fringed by a reef, which extends 3½ cables from the north-western side. (*See* view facing page 39.) The channel between the island and Pulanduta point is deep in the fairway and clear of dangers.

A light (*Lat. 11° 51′ N., Long. 123° 07′ E.*) is exhibited, at an elevation of 187 feet (57^{m}0), from a grey square stone tower, with a white dwelling attached on the southern and highest point of Jintotolo island.

Cucaracha shoal, about 5 miles north-north-eastward of Bulacaue point, has a least depth of 9 feet (2^{m}7) over it. Several patches, with depths of from 37 to 54 feet (11^{m}3 to 16^{m}5) over them, lie within 5¾ miles north-north-eastward of Cucaracha shoal.

Two shoals, with depths of 24 and 25 feet (7^{m}3 and 7^{m}6) over them, lie 12 and 15 miles, respectively, north-eastward of Bulacaue point. A 27-foot (8^{m}2) patch lies about one mile northward of the 24-foot (7^{m}3) shoal.

Circe bank, of coral, with a least depth of 19 feet (5^{m}8) over it, and steep-to, lies 7½ miles east-south-eastward of Pulanduta point, with a 7-fathom (12^{m}8) patch about midway between.

Manigonigo islet, about 1½ miles eastward of Bulacaue point, lies on the north-eastern extremity of the coastal bank, with depths of less than 3 fathoms (5^{m}5) over it, which extends from the coast of Panay. The islet is flat and surrounded by rocks which extend to a distance of one cable from all sides except on the south, where they extend 2 cables.

A light is exhibited, at an elevation of 68 feet (20^{m}7), from a white circular iron tower, with a white dwelling attached, on Manigonigo islet.

Anegada rocks are two rocks, with depths of less than 6 feet (1^{m}8) over them, lying on the coastal bank about three-quarters of a mile south-south-westward of Manigonigo islet.

Nabunut island, about 100 feet (30^{m}5) high, and wooded, lies 1¾ miles east-south-eastward of Manigonigo islet. It is fringed by a narrow reef and is connected with Tulunanaun island, about 2 miles south-eastward, by a bank, with depths of from one to 3 fathoms (1^{m}8 to 5^{m}5) over it. Tulunanaun island is 131 feet (39^{m}9) high near its

Charts 3807, 3808, 943, 1263.

Chart 3822.

northern end; it is fringed with reefs which dry, extending about a quarter of a mile offshore. The bank on which Nabunut and Tulunanaun islands lie has depths of from one to 5 fathoms ($1^{m}8$ to $9^{m}1$) over it, and extends about 4½ miles eastward of Manigonigo islet; it forms the western side of the channel westward of Balbagon island.

Balbagon island, 3½ miles eastward of Nabunut island, is low, with a small sandhill at its southern end, and covered with trees about 100 feet ($30^{m}5$) high; it lies on the western side of an extensive bank, over which there are depths of less than 5 fathoms ($9^{m}1$), and is fringed by reefs, which dry, extending one mile from its northern side. Ojastras (Ohastras) islet, a sandy cay, lies half a mile southward of Balbagon island, with which it is connected by shoal water. Turnina islet lies on a detached reef about three-quarters of a mile eastward of Balbagon island. Tacut (Takut) reef, which dries, lies about 1¼ miles eastward of Ojastras islet, and on the eastern edge of the extensive bank described above.

The channel westward of Balbagon island is the one usually taken by small vessels with local knowledge; it has a navigable width of one mile and is deep and clear of dangers in the fairway. The channel between Tacut reef, and the island of South Gigante is also recommended if possessing local knowledge.

Gigante islands are a group of two islands and several islets and detached rocks lying about 10 miles eastward of Bulacaue point. The group is clear of dangers on the northern side, and the reefs and shoals on the other sides do not extend more than three-quarters of a mile, except a 6-fathom ($11^{m}0$) patch lying about 2¼ miles west-north-westward of the southern extremity of North Gigante.

North Gigante is 758 feet ($231^{m}0$) high near the northern end, and wooded; it is fringed by reefs which dry, extending about half a mile from the eastern and western sides.

A light is exhibited, at an elevation of 77 feet ($23^{m}5$), from a white circular iron tower, with a white dwelling with a red roof, on the northern extremity of North Gigante (*Lat. 11° 38′ N., Long. 123° 21′ E.*). *See* view facing page 39.

Uaydajon (Uaydahon) islet, 263 feet ($80^{m}2$) high to the tops of the trees, and steep-to, lies three-quarters of a mile eastward of the northern end of North Gigante. The channel between them has depths of from 7 to 9 fathoms ($12^{m}8$ to $16^{m}5$). On the south-eastern edge of the reef surrounding North Gigante are three rocky islets.

South Gigante, half a mile southward of North Gigante, is well wooded, and 763 feet ($232^{m}6$) high near the southern end. On the northern side, the fringing reef, which dries, extends about 3 cables offshore; between it and the reef extending from the southern side of the northern island is a channel with a least depth of 10 feet ($3^{m}0$). About one mile south-eastward of South Gigante are three islets lying on the same reef, namely Bantigui, 60 feet ($18^{m}3$) high, Cabugao (Kabugao), 357 feet ($108^{m}8$), and Antonia, 322 feet ($98^{m}1$). About half a mile eastward of Antonia islet is a shoal, with a least depth of 13 feet ($4^{m}0$) over it, and a 6-fathom ($11^{m}0$) patch lies one mile farther eastward. The channel between these islets and South Gigante is over half a mile wide, with depths of from 6¾ to 9 fathoms ($12^{m}3$ to $16^{m}5$).

Vessels with local knowledge may obtain anchorage during the North-east monsoon off the south-western side of South Gigante, in a

Charts 3807, 3808, 943, 1263.

Chart 3822.

depth of 7 fathoms (12^{m}8), mud and sand. During the South-west monsoon small craft with local knowledge can anchor in the channel between North Gigante and South Gigante.

Chart 3808.

VISAYAN SEA.—The Visayan sea is situated between the southern side of Masbate on the north, the northern ends of Negros and Cebu on the south, the eastern side of Panay on the west, and the northern end of Leyte on the east.

Islands and dangers.—Lights.—The Visayan sea is encumbered with numerous dangers, the position of which may best be seen on the chart. Only those which lie in or near the usual tracks of vessels navigating between Jintotolo channel and Guimaras strait, and between Jintotolo channel and the northern end of Cebu will be described.

The dangers in Jintotolo channel have been described on page **354**.

Charts 3822, 3823.

A shoal, with a depth of 4 fathoms (7^{m}3) over it, lies 5 miles east-north-eastward of North Gigante lighthouse. Two 34-foot (10^{m}4) patches lie 9½ and 10¼ miles, respectively, eastward of North Gigante lighthouse, and a 19-foot (5^{m}8) patch lies 10 miles east-north-eastward. A shoal, with a depth of 21 feet (6^{m}4) over it, lies about 6 miles eastward of South Gigante, and two shoals, with depths of 33 and 40 feet (10^{m}1 and 12^{m}2) over them, lie 11 and 13 miles eastward of the same island. A 5-fathom (9^{m}1) patch lies about 16 miles eastward of North Gigante lighthouse.

Tanguingui islet, about 23 miles east-south-eastward of North Gigante lighthouse, is a flat sandy cay, 22 feet (6^{m}7) high.

A light is exhibited, at an elevation of 129 feet (39^{m}3), from a black steel tower and a white lantern, with a white-roofed dwelling at its base, on Tanguingui islet (*Lat. 11° 29′ N., Long. 123° 43′ E.*). *See* view facing page 38.

A shoal, with a depth of 37 feet (11^{m}3) over it, lies about 5 miles north-north-eastward and a coral reef, with a least depth of 9 feet (2^{m}7) over it, about 6 miles southward of Tanguingui islet.

Chart 3823.

Manocmanoc (Manokmanok) islets are a group of three flat-topped, vertical uninhabited rocks lying on a reef situated about 8 miles southward of Caduruan point, the south-eastern extremity of Masbate. The southern and highest islet has an elevation of 54 feet (16^{m}4). There is some foul ground about a quarter of a mile westward of the group.

Carnasa (Karnasa) island, about 4¼ miles south-eastward of the Manocmanoc islets, has a group of wooded hills, 140 feet (42^{m}7) high, in the north-eastern part; on the eastern side there are some cliffs, about 60 feet (18^{m}3) high. The island is fringed by a narrow reef and may be safely rounded at a distance of about half a mile. A detached rock, 43 feet (13^{m}1) high, lies close off the southern end of the island. The island is inhabited.

Maria islet, 58 feet (17^{m}7) high, rocky, and steep-to, lies nearly one mile south-south-eastward of Carnasa island. The channel between them is over half a mile wide, with a depth of 12 fathoms (21^{m}9) in the middle.

Gato islet, 5½ miles south-westward of Carnasa island, is a pre-

Chart 3823.

cipitous rock, 321 feet (97^{m}8) high, with a few bushes on its summit; it is a prominent mark. The cliffs are underworn, making landing almost impossible.

Vessels from Jintotolo channel bound for Cebu, pass about 2 miles southward of Gato islet if going northward of Malapascua island, and about 5 miles southward if intending to pass between Malapascua island and the island of Cebu.

A shoal, with a depth of 7 fathoms (12^{m}8) over it, lies about 4 miles south-south-eastward of Gato islet.

Guintacan (Guintakan) island, 167 feet (50^{m}9) high, lies about 13 miles south-eastward of Tanguingui islet; the top of the island is a fairly level plateau covered with low trees and grass. The island is bounded on all sides by rocky cliffs ranging from 100 feet (30^{m}5) high at the northern end to 40 feet (12^{m}2) at the southern end, and is steep-to. There are several villages on the island. Indifferent anchorage may be obtained by vessels with local knowledge, in a depth of 16 fathoms (29^{m}3), sand, about 4 cables offshore, off the village of Pasil on the south-east coast, and off Langob village on the south-west coast.

Malapascua island and the northern extremity of the island of Cebu are described on page 406 and Bantayan island on page 445.

Chart 3822.

EASTERN SIDE OF PANAY.—Coast.—Between Blanca point, situated 2 miles south-south-eastward of Bulacaue point (page 353), and Gogo point, about 5 miles farther southward, the coast is low, intersected by several rivers, and fronted by Binuluangan and Tabugan islands and several islets. Bancal (Bankal) bay, formed between the two points, is very shallow and at low water sandbanks block the passage to the rivers The shallow coastal bank extends around Blanca point northward and surrounds Manigonigo islet.

Islands and dangers.—Binuluangan island, 198 feet (60^{m}3) high and wooded, is fringed with reefs on which lie several islets on the seaward side. Gogo pass, between the south-western point of Binuluangan island and Gogo point, is shallow.

Calagnaan (Kalagnaan) island, 1,112 feet (339^{m}0) high, and wooded, is separated from the south-eastern side of Binuluangan island by Nilidlaran pass. The eastern and southern sides of the island are steep-to, but the western and north-western sides are fringed with reefs. On the north-western side are two bights encumbered by reefs. Nilidlaran pass is divided into two shallow, narrow and tortuous channels by Labno islet, lying close northward of the western extremity of Calagnaan island; the western channel has a width of three-quarters of a cable and is the one generally used, but it should only be attempted by vessels with local knowledge.

Cañas islet (*Lat. 11° 29′ N., Long. 123° 15′ E.*), 310 feet (94^{m}4) high, and steep-to, lies about 8½ cables eastward of Calagnaan island. A pinnacle rock, with a depth of 3 feet (0^{m}9) over it, lies about 3¼ cables north-eastward of the islet. Carmencita shoal, with a depth of 3 feet (0^{m}9) over it, sand and rock, and steep-to, lies one mile south-eastward of Cañas islet. The navigable channel between them is three-quarters of a mile wide, and that between the shoal and Sicogon island is 3¾ cables wide.

Sicogon (Sikogon) island, about half a mile south-eastward of Calag-

Charts 3808, 943, 1263.

Chart 3822.

naan island, is 1,142 feet (348^{m}1) high in the south-eastern part. In the north-western part is a hill, 1,129 feet (344^{m}1) high, which forms, with Cañas islet, a good mark for navigating the channel westward of Balbagon island. (*See* page 355). The north-eastern side of Sicogon island is fringed by a wide reef, which dries, on the eastern edge of which is Tumaguin islet, 359 feet (109^{m}4) high and prominent. The south-eastern side of the islet is clear of dangers, but the western side is connected by a reef to the north-eastern point of Sicogon island.

About 5½ miles north-eastward of Tumaguin islet is a shoal, with a depth of 33 feet (10^{m}1) over it, 1½ miles southward of which is a 25-foot (7^{m}6) patch. A 4-fathom (7^{m}3) patch, which is steep-to, lies about 2½ miles eastward of the islet.

Sicogon (Sikogon) channel, between Calagnaan and Sicogon islands, has a depth of 12 fathoms (21^{m}9) in the middle ; it is clear of dangers and is the channel generally used by coasting vessels.

Coast.—Between Gogo point and Salong point, 6¼ miles southward, there is a bay fronted by several islets. Estancia is a small town, situated about 2 miles southward of Gogo point ; in it there are two large houses with galvanised iron roofs visible a considerable distance. There is occasional communication by steamer with Manila, Capiz and Iloilo.

A concrete pier, with a depth of 18 feet (5^{m}5) alongside, is situated about half a mile southward of Estancia.

Light.—A light is exhibited, at an elevation of 32 feet (9^{m}8), from a white concrete beacon, situated about 3 cables southward of Estancia.

Anchorage.—Good anchorage may be obtained by vessels with local knowledge between Estancia and the Bayas islets, described below, in a depth of 5 fathoms (9^{m}1) mud. This is the only anchorage in the vicinity which is protected in all seasons. The only danger in the anchorage is a small rocky shoal, with a depth of about 4 feet (1^{m}2) over it, lying about midway between the Bayas islets and Loguingut islet, which is situated about 1½ miles south-eastward of Gogo point.

Off-lying islets.—Bayas islets are a group of four islets lying within 2¼ miles south-eastward of the light-beacon at Estancia. Bayas, the easternmost and largest islet, is 216 feet (65^{m}8) high ; Manipulon islet, 168 feet (51^{m}2) high, is separated from the western side of Bayas islet by a narrow channel, in which there is a depth of 5 fathoms (9^{m}1) ; the other islets of the group are low, and have no channels between them. They are surrounded by sandbanks and rocks. Between Pangalan, the western islet, and the coast of Panay there is a channel about half a mile wide, with a least depth of 22 feet (6^{m}7) in it. A rock awash lies about 6 cables southward of Pangalan islet.

Charts 3822, 3824.

Magalumbi islet (*Lat. 11° 23′ N., Long. 123° 10′ E.*), 159 feet (48^{m}5) high, lies half a mile north-eastward of Salong point ; it is fringed by a reef which narrows the channel between it and the coast of Panay to about one cable.

Coast.—Malpal point, 2½ miles south-south-westward of Salong point, is a bold, steep-to headland, 1,151 feet (350^{m}8) high. Immediately northward of it is Odiongan bay, the head of which is encumbered with reefs. Odiongan village is situated on the northern shore. On the southern side of Malpal point is Bagacay (Bagakai) bay, the head of which is occupied by a reef which dries. Bagacay (Bagakai)

Charts 3808, 3809, 943, 1263.

Charts 3822, 3824.

village is situated near the shore on the northern side of the head of the bay.

Between Malpal point and Concepcion village, 7¾ miles southward, the coast is fringed by reefs, outside which shoal water extends a considerable distance. San Dionisio village is situated 5 miles south-south-westward of Malpal point. Matagda and Lacdian islets lie on the coastal bank, about three-quarters of a mile eastward and east-south-eastward, respectively, of San Dionisio. About 1½ miles north-eastward of Matagda islet and about one mile offshore is a coral reef, which dries, with depths of from 9 to 15 feet ($2^{m}7$ to $4^{m}6$) between the reef and the coast, and 27 feet ($8^{m}2$) between the reef and the reefs north-westward of Tago island, one mile south-eastward.

Off-lying islands and dangers.—Culebra islet, 116 feet ($35^{m}4$) high, lies 4 miles south-eastward of Magalumbi islet. A bank, on which there is a reef, partly awash, extends half a mile westward.

There are three steep-to shoals, with depths of from 15 to 18 feet ($4^{m}6$ to $5^{m}5$) over them, lying from 2½ to 4½ miles north-eastward and east-north-eastward of Culebra islet. A rocky shoal, with a depth of 25 feet ($7^{m}6$) over it, lies 2 miles south-south-westward of the islet.

Pan de Azucar is the largest and northernmost of a group of islands situated at the northern approach to Guimaras strait; it lies about 2¾ miles from the coast of Panay, and has two prominent peaks, the south-eastern and higher having an elevation of 1,881 feet ($573^{m}3$). The south-eastern side of the island is steep-to, the remaining sides being fringed with reefs on which there are several islets and rocks.

Naburut islet, 143 feet ($43^{m}6$) high, lies on the reef off the north-western point of Pan de Azucar. Magaisi islet, 232 feet ($70^{m}7$) high, lies on the fringing reef on the northern side of the island; about 4 cables northward of Magaisi islet is Bocot (Bokot) islet, from which it is separated by a narrow channel, with a depth of 40 feet ($12^{m}2$). Sombrero islet, less than a quarter of a mile from the south-eastern side of Pan de Azucar island, is a conical-shaped islet connected to it by a sandbank, which dries; it is 459 feet ($139^{m}9$) high, and well wooded.

Chart 3824.

Tago island (*Lat. 11° 15′ N., Long. 123° 08′ E.*), separated from the south-western side of Pan de Azucar island by Pan pass, a narrow impassable channel, is 557 feet ($169^{m}7$) high in the southern part. It is fringed by reefs which are generally steep-to on the eastern side. About half a mile south-eastward of the south-eastern point is a rock awash, and some sunken rocks lie within 1¾ cables of the southern point. A coral reef, which dries, lies about 6 cables northward of the north-western point of the island.

Charts 3822, 3824.

Four shoals, with depths of from 9 to 18 feet ($2^{m}7$ to $5^{m}5$) over them, lie from about 5½ to 7½ miles eastward of Lanuan point, the eastern extremity of Pan de Azucar island.

Malangaban island, 785 feet ($239^{m}3$) high, and wooded, lies about 2 miles south-eastward of Pan de Azucar island; it is clear of dangers except on the south-western side, where a reef, which dries, extends nearly half a mile westward and surrounds Chico islet.

Chart 3824.

Coast.—Concepcion bay, between Tago island and the coast of

Panay, is encumbered with reefs and shoals. Concepcion village is situated at the head of the bay. There is occasional communication by steamer with Capiz and Iloilo.

Tago pass is a very narrow channel between the reefs extending from Panay and those from the southern end of Tago island. In the northern entrance there is a depth of 9 feet ($2^{m}7$), increasing to 19 feet ($5^{m}8$) in the southern entrance. Tago reef, which dries, lies in the northern entrance. The tidal streams run at a considerable rate in the pass, and it should not be attempted without local knowledge.

Off-lying islands and dangers.—Light.—Botlog islet, 372 feet ($113^{m}4$) high, and steep-to, lies about three-quarters of a mile southward of Pan de Azucar island. It is covered with trees, and divides the passage between Pan de Azucar and Igbon island into two channels, the southern of which is generally used by the coasting steamers.

Bagabu islet, low and wooded, lies about one mile south-eastward of the southern extremity of Tago island. A sand spit, which dries, extends from the islet nearly across to a prominent green point on Panay, leaving a narrow channel with a depth of 19 feet ($5^{m}8$) between them.

Igbon island, 774 feet ($235^{m}9$) high, and wooded, lies about 1¼ miles south-westward of Malangaban island. The northern and south-western sides are fringed by steep-to coral reefs; the remainder of the island is clear of dangers and steep-to. Agho islet, 110 feet ($33^{m}5$) high, lying about midway between Malangaban and Igbon islands, is fringed by a narrow reef which is steep-to. About 3 cables off the southern end of Igbon island are Bulubadiangan and Dunao islets, 220 and 92 feet ($67^{m}1$ and $28^{m}0$) high, respectively, and between them a good but contracted anchorage may be obtained by small vessels with local knowledge.

Baliguian islet, 8¾ miles eastward of Igbon island, is densely wooded, the tops of the trees appearing like land from a distance. It is fringed by a narrow reef, which is steep-to. Two shoals, with depths of 15 feet ($4^{m}6$) over them, lie about 4½ miles north-north-eastward and 4 miles north-eastward, respectively, of Baliguian islet; a 9-foot ($2^{m}7$) patch was reported, in 1945, about 8 cables north-north-westward of the latter shoal; a shoal, with a depth of 22 feet ($6^{m}7$) over it, lies 3½ miles eastward, and another, with a depth of 2 fathoms ($3^{m}7$) over it, lies 2 miles southward of the islet. There are numerous other shoals farther eastward, outside the usual track of vessels proceeding to Iloilo, the positions of which may best be seen on the chart.

A light is exhibited, at an elevation of 80 feet ($24^{m}4$), from a white steel tower, on Baliguian islet (*Lat. 11° 12′ N., Long. 123° 20′ E.*).

NORTH-EASTERN APPROACH TO GUIMARAS STRAIT.

The north-eastern approach to Guimaras strait lies between the south-eastern side of Panay and the north-western side of Negros. Mount Apiton, 1,416 feet ($431^{m}6$) high, is a bold round headland at the south-eastern extremity of Panay.

Islands and dangers.—Channels.—Binanan island, close south-westward of Mount Apiton, is 440 feet ($134^{m}1$) high, and is connected to the coast of Panay by extensive mangrove swamps and mud flats,

Chart 3824.

which dry. Apiton cove, on the eastern side of the island, is encumbered with shoals. The southern side of the island is steep-to.

Tagubanhan island, 980 feet ($298^{m}7$) high, and well wooded, is separated from the coast of Panay south-eastward of Mount Apiton (*Lat. 11° 11′ N., Long. 123° 06′ E.*) by Apiton pass, which is the southern termination of the inshore route to Iloilo from northward. The island is fringed by a narrow steep-to reef. Apiton pass has a least width of about three-quarters of a mile, and is deep and clear of dangers except for a 19-foot ($5^{m}8$) patch at the northern end about 2 miles eastward of Mount Apiton. The shores on either side of the pass are steep-to.

Anauayan islet, 178 feet ($54^{m}2$) high, and steep-to, lies about 2 miles eastward of the southern extremity of Tagubanhan island; it is separated from the island by Anauayan channel, which is deep in the fairway and clear of dangers except for a 21-foot ($6^{m}4$) patch situated about one mile south-south-westward of the southern extremity of Tagubanhan island.

Ilacaon (Ilakaon) islet, about 3¾ miles south-eastward of Anauayan islet, is 6 feet ($1^{m}8$) high; it has some coconut trees and bushes on it and is inhabited. It lies on an extensive reef, which dries, extending about 1½ miles east-north-eastward, and 6 cables west-south-westward from it.

Ilacaon (Ilakaon) channel lies between Anauayan and Ilacaon islets. About midway between the two islets is Ilacaon (Ilakaon) reef, with a depth of 10 feet ($3^{m}0$) over it, and between Ilacaon reef and the reef extending east-north-eastward from Ilacaon islet are two 27-foot ($8^{m}2$) patches. Sacramento rock, with a depth of 3 feet ($0^{m}9$) over it, lies in the approach to Ilacaon channel, 6¼ miles east-north-eastward of Ilacaon islet.

Turia rock, with a depth of 3 feet ($0^{m}9$) over it, lies 5½ miles westward of Ilacaon islet. About a quarter of a mile north-eastward of the rock is a 15-foot ($4^{m}6$) patch. Turia rock cannot be distinguished except when close to it.

Ilacaon (Ilakaon) point, the northern extremity of Negros, is low and sandy. There is shoal water between the point and Ilacaon islet, about 2¼ miles northward, but there is a narrow passage about 3½ cables southward of the islet, with a least depth of 21 feet ($6^{m}4$), where small craft with local knowledge may obtain anchorage during the North-east monsoon. A rock, awash, lies about one mile south-eastward of Ilacaon islet.

The coast of Negros eastward of Ilacaon point and its off-lying dangers are described on pages 442-445.

Northern and western sides of the strait.—Dangers.—Light.—Buoy.—Between Binanan island and Malauig Balas point, about 5 miles south-westward, is a large bight, at the head of which is Ajuy (Ahui) bay. The village of the same name is situated in the north-western corner of the bay, about half a mile up Ajuy river. A bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends 2 miles south-eastward from the mouth of the river, and on its edge is Salog islet, 175 feet ($53^{m}3$) high, and fringed by a reef, which dries.

Buri islet, 160 feet ($48^{m}8$) high, lies half a mile southward of Salog islet; both islets are inhabited. The pearl banks of Ajuy are off these islets. Guinasian islets, consisting of Nasiducang (Nasidukang)

Charts 3808, 3809, 943, 1263.

Chart 3824.

and Bayang islets, lie 1½ and 2¼ miles, respectively, south-south-westward of Buri islet and one mile off the coast of Panay.

Calabazas island (*Lat. 11° 05′ N., Long. 123° 01′ E.*), 195 feet ($59^{m}4$) high, and wooded, lies about 3½ miles south-south-westward of Buri islet and one mile offshore. Nasidman islet, 138 feet ($42^{m}1$) high, lies about 3 cables west-south-westward of Calabazas island; it is fringed by a reef, and between the reef and the coastal bank extending from Panay there is a channel about 3 cables wide and a depth of 39 feet ($11^{m}9$) in the middle.

A light is exhibited, at an elevation of 99 feet ($30^{m}2$), from a white circular iron tower, and a white dwelling with a red roof, at its base, on Calabazas island. *See* view facing page 39.

Pepitas rocks, about 2 miles south-south-westward of Calabazas island, are a group of black rocks, covered only at extreme high water.

Between Malauig Balas point and the southern entrance point of Banate bay, about 17 miles south-westward, the coast of Panay is indented by five bays, all of which are encumbered with shoals; they are separated by high prominent headlands which are steep-to. Culasi (Kulasi) bay is the north-easternmost of these, with the village of the same name at its head. Pedada bay, immediately south-westward of Culasi bay, has a depth of 3 fathoms ($5^{m}5$) in its entrance. Mount Bayang, 728 feet ($221^{m}9$) high, is the summit of the small peninsula which separates Pedada and Cañas bays. This peninsula is connected to the mainland by a mangrove swamp, through which there is a boat channel, passable at high water.

Cañas bay has a depth of 5 fathoms ($9^{m}1$) in its entrance and shoals gradually towards the head. The villages of San Fernando and Santiago are situated on the shore of the bay. Mount San Nicolas, 1,063 feet ($324^{m}0$) high, and well wooded, is the summit of the headland separating Cañas and Barotac bays, and is prominent.

Barotac (Barotak) bay has a depth of 5 fathoms ($9^{m}1$) in its entrance and shoals gradually towards the head. Barotac (Barotak) Viejo village is situated on Barotac (Barotak) river, about one mile from the head of the bay, and there are several small villages standing on its shores. San Juan point, the south-western entrance point of Barotac bay, is a prominent headland, 197 feet ($60^{m}0$) high. About 6½ cables south-westward of the point is a rock, 2 feet ($0^{m}6$) high, lying on a shoal, with a least depth of 13 feet ($4^{m}0$) over it.

Banate bay lies south-westward of San Juan point, with the town of Banate on its northern shore. There is a depth of 3 fathoms ($5^{m}5$) about one mile southward of the town, from which position the depths decrease gradually towards the shore.

From the southern entrance point of Banate bay to Dumangas point (*Lat. 10° 47′ N., Long. 122° 44′ E.*), about 9 miles south-south-westward, the coast is low, fringed with mangroves, and by a bank, which extends as much as 2½ miles offshore with depths of less than 3 fathoms ($5^{m}5$) over it.

Between Dumangas point and Navalas point, 4¼ miles southward, is the entrance to Iloilo strait (*see* page 367). Between Navalas point and Icauayan (Ikauayan) point, 10¾ miles southward, the eastern coast of Guimaras island is mostly sandy, backed by low hills covered with grass and brushwood. A bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends from half to three-quarters of a mile offshore.

Charts 3808, 3809, 943, 1263.

Chart 3824.

Southern and eastern sides of the strait.—Dangers.—Between Ilacaon point and the mouth of Victorias river, about 9½ miles south-westward, the northern coast of Negros is low, flat, and bordered by mangroves, trees and bushes; the interior is mostly open country, and cultivated. The land rises gradually from the coast to the foot of the mountains. The coastal bank extends 2 miles offshore in places, with depths of less than 3 fathoms ($5^{m}5$) over it; several detached reefs, the outermost, with a depth of 3 fathoms ($5^{m}5$) over it, lie near the outer edge of the bank, about 6 miles westward of Ilacaon point.

Balaulan reef, with a depth of about one foot ($0^{m}3$) over it, and 25 feet ($7^{m}5$) immediately north-westward of it, lies about 3 miles south-westward of Ilacaon islet, and about 1¾ miles offshore. Salong reef, which dries, lies 1½ miles northward of the mouth of the Manapla river, which discharges about 5 miles south-westward of Ilacaon point. Manapla, the principal town on this part of the coast, stands at the mouth of the river. Coral reefs extend a considerable distance from both sides of the entrance to the river and the bar nearly dries. Small craft with local knowledge can enter the river at high water or may obtain anchorage, in a depth of 3 fathoms ($5^{m}5$), about 1¾ miles northward of the entrance.

The town of Victorias is situated just inside the mouth of the river of the same name. The river has a narrow channel, with a depth of about one-foot ($0^{m}3$) on the bar; small craft can enter it at high water.

Cambanog (Kambanog) shoal, which dries, lies about 5 miles west-north-westward of Victorias, and 1¼ miles offshore. This shoal, and Balaulan and Salong reefs lie close to the edge of the coastal bank with depths of less than 3 fathoms ($5^{m}5$) over it, and inside them the depths decrease gradually to the coast.

About 4½ miles westward of Victorias, Madalag Daco (Dako) river discharges; it is navigable by small craft with local knowledge at high water as far as the bridge at the town of Saravia, about one mile from the coast. The town is not visible from seaward, being inside the mangrove marsh which extends along the coast.

Tomonton point (*Lat. 10° 54′ N., Long. 122° 57′ E.*), the north-western extremity of Negros, is low, swampy, and covered with mangroves for about one mile inland. Tomonton shoal, with depths of from 3 to 9 feet ($0^{m}3$ to $2^{m}7$) over it, extends 3 miles north-westward from the point.

Between Tomonton point and Pandan point, 24 miles south-south-westward, the coast of Negros forms a bight, the entire shore of which is fringed by a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extending 2½ miles off in places. Between Tomonton point and Calubcub (Kalubkub) point, about 4 miles southward, the coast is fringed with mangroves, thence to Pandan point, it is low and sandy, and bordered with coconut palms. The towns of Silay (Silai), Talisay (Talisai), Bacolod (Bakolod) and Bago are situated on this coast, about 5¾, 9½ and 13½ miles, respectively, southward of Tomonton point.

Anchorage may be obtained, in a depth of 6 fathoms ($11^{m}0$), with Silay church bearing 114°, and Mambagid point, situated about 4 miles north-north-westward of Silay, bearing 035°.

Abreast Silay, there is a small wooden pier, which, in 1937, had a depth of 12 feet ($3^{m}7$) at its head. In the town there is a church

Charts 3808, 3809, 943, 1263.

Chart 3824.

with a dome and a white chimney, both of which are prominent. There is frequent communication by steamer with Iloilo. Talisay shows up well from seaward. Three white chimneys close southward of Talisay are prominent. A pier, which, in 1937, had a depth of 3 feet (0^m9) alongside, extends from the southern bank of Mandalagan river, which discharges 3 miles southward of Talisay. Bacolod is the capital of Occidental Negros, and the largest town on the island. Santo Nino, the loading place for Bacolod, is situated about 1¼ miles northward of that town ; it contains a church with twin towers and a galvanised iron roof, and several other prominent buildings. There is a small pier at Santo Nino, but it was reported, in 1949, to be badly damaged. There is regular communication by air with Iloilo.

Bago stands on the eastern side of the entrance to the river of the same name, which discharges 2½ miles north-eastward of Pandan point. The large buildings with galvanised iron roofs show well through the opening in the trees at the mouth of the river. Small craft with local knowledge can enter the river at high water. There is a shallow sand bar across the mouth of the river.

GUIMARAS STRAIT. — Islands. — Dangers. — Buoyage. — Guimaras strait, between Guimaras island and the west side of Negros, has a least width of 6 miles, but the navigable channels are narrowed by the islet and banks at the southern entrance.

Charts 2391, 3824.

The eastern side of the navigable channel of Guimaras strait is formed by a shoal which extends 11 miles south-south-westward from Pandan point, Negros island, and Iogiog bank. The outer end of this shoal, which has a depth of one fathom (1^m8) over it, is known as Pontevedra shoal. Pandan point is low, sandy, and covered with coconut trees, and is prominent from northward or southward ; its western extremity is steep-to, but shoal water extends northward and southward from it. The coast of Negros southward of Pandan point is described on page 436.

On the southern side of Pandan point (*Lat. 10° 31′ N., Long. 122° 48′ E.*) is the town of Pulupandan, which has a concrete pier, with a least depth of 19 feet (5^m8), mud, alongside, in 1949. Water is laid on to the pier. The town is open to foreign shipping. *See* page 3.

Chart 2391.

There is a 2-fathom (3^m7) patch about a quarter of a mile southward of the head of the pier, and a 5-fathom (9^m1) patch close westward of the pier.

Iogiog bank, which dries, lies between Pandan point and Nadulao island, 3½ miles west-south-westward, leaving a navigable channel between it and the point about 4½ cables wide, with a least depth of 2¾ fathoms (5^m0) at its northern end. A spur, with a least depth of 2¼ fathoms (4^m1) over it, extends north-westward from the western side of the bank, leaving a channel about three-quarters of a mile wide, with a least depth of 8 fathoms (14^m6) in the fairway, between it and Nadulao island.

The north-eastern side of Iogiog bank is marked by a black can buoy, No. 3, the northern extremity by a conical buoy, painted in black and red horizontal bands, and the western side by a red conical buoy.

Charts 3809, 943, 1263.

Chart 2391.

A chain of islands lies on the western side of Guimaras strait extending about 7 miles south-westward from Nadulao island. This island is 213 feet ($64^{m}9$) high, and covered with grass. It is deeply indented on its north-eastern side by a bay, which dries, and in which there is an islet. An islet lies 3 cables northward of the north-eastern point of the island. A spit, with depths of less than 5 fathoms ($9^{m}1$) over it, extends about 1¼ miles northward from the island, and a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends three-quarters of a mile southward.

Nalunga island, 427 feet ($130^{m}1$) high, and covered with grass, lies about three-quarters of a mile south-westward of Nadulao island. The channel between them has a least charted depth of 6¾ fathoms ($12^{m}3$) in the fairway. An islet lies about 1½ cables off the northern side of Nalunga island, to which it is connected by a reef; a rock above water, lies 1¾ cables off the north-eastern side of the island. A bank, with depths of from one to 3 feet ($0^{m}3$ to $0^{m}9$) over it, extends one mile southward from the island, narrowing the navigable channel between it and the north-eastern side of Inampulugan island to half a mile. In the middle of this channel there is a shoal which dries.

Inampulugan island, 634 feet ($193^{m}2$) high, is the largest and most prominent island of the chain; on its eastern point there is a hill with a rocky bluff on its eastern side, which is connected with the land westward by a low strip. The coast is steep-to except at its northern point, where the fringing reef extends about 3 cables offshore.

Rosario rock, with a depth of 3 feet ($0^{m}9$) over it, and steep-to, lies about half a mile southward of the middle of the southern side of Inampulugan island. A bank, with depths of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$) over it, extends about 3 miles south-westward and about half a mile eastward from Rosario rock.

Nauai, 120 feet ($36^{m}6$) high, Nagarao, and Nalibas islets lie south-westward of Inampulugan island. Seraray and Pamancolan (Pamankolan) islets lie about 4 and 9 cables, respectively, northward of Nalibas islet, and Susan islet about 1¾ miles north-north-eastward of Nauai islet.

Panubulon and Guiuanon are two flat-topped islands, about 50 feet ($15^{m}2$) high, lying from one to 2 miles southward of Guimaras island; the former is fringed by a reef on which there are several islets, but the latter island is clear of dangers. The best anchorage in this vicinity may be obtained in the bay on the southern side of Guimaras island, about 4 miles east-north-eastward of South point, the southern extremity of the island.

Chart 3824.

Toyo reef, which dries, lies about 2½ miles southward of Panubulon island. The depths between them are very irregular, varying from 3½ to 10 fathoms ($6^{m}4$ to $18^{m}3$).

Unisan islets (*Lat. 10° 20′ N., Long. 122° 35′ E.*) are a group of two rocky islets and several rocks above water lying about 3½ miles southward of the western end of Guiuanon island. Unisan, the central and largest of the group, is 93 feet ($28^{m}3$) high, and partly covered with coconut trees. Malingin islet, 105 feet ($32^{m}0$) high, lies 4 cables eastward of Unisan islet. Between Toyo reef and the Unisan islets there is a channel about one mile wide, with a least depth of 7 fathoms ($12^{m}8$) in the fairway.

Chart 3284.

Close northward of South point, is Tandog island, lying close offshore; the channel between it and Guimaras island is encumbered with reefs, and in the bay northward of it are several islets. A detached shoal, with a depth of 5 feet (1^m5) over it, lies about 8½ cables westward of the southern extremity of Tandog island, and a 15-foot (4^m6) patch lies about a quarter of a mile westward of South point.

Chart 2391.

Channels.—The main channel through Guimaras strait lies between Inampulugan, Nalunga and Nadulao islands on the west, and Iogiog bank on the east. The eastern channel lies between Iogiog bank and Pandan point. There are several narrow channels between Inampulugan and Guimaras islands; they should be navigated with caution, as there are several rocky, wooded islets and dangers in them.

Charts 2391, 3824.

Prohibited anchorage.—Anchoring is prohibited within an area, indicated by pecked lines on the charts, covering the southern part of Guimaras strait.

Chart 2391.

Directions.—A vessel approaching Guimaras strait from northward or southward should bring the eastern points of Nadulao and Inampulugan islands in line bearing 198° or 018°, respectively, and steer for them, giving them a berth of a quarter to half a mile in passing; both points are steep-to. A vessel bound northward may shape course as desired as soon as she has passed Nadulao island; a vessel bound southward should, after passing Inampulugan island, continue her course with the above points in line until Guiuanon island bears 270°, and then haul westward a little to give the shoal water off the coast of Negros a good berth.

A vessel approaching the eastern channel from northward should steer for Pandan point, bearing 169°, which leads through in a least depth of 28 feet (8^m5), this depth being obtained from about one mile northward of the point. When the black and red conical buoy marking the northern end of Iogiog bank is abeam she should alter course southward and pass about a quarter of a mile westward of the point; when the point bears 020° she should keep it astern on that bearing until the hill on the eastern point of Inampulugan island bears 271°, when she should alter course westward to give the bank extending from the west coast of Negros a good berth.

A vessel from southward intending to use the eastern channel should steer for the western extremity of Inampulugan island (*Lat. 10° 28′ N., Long. 122° 42′ E.*), bearing 001°; when well clear of Pontevedra shoal she should alter course north-eastward until Pandan point bears 020°, when she should steer for it on that bearing, passing it as directed for a vessel proceeding southward, and then steer 000°; when about 1½ miles northward of the point she may alter course as necessary.

If intending to proceed alongside the pier she should steer for it when it bears 090°. During the South-west monsoon it is advisable to anchor in a depth of 8 fathoms (14^m6), about half a mile westward of the pier, or on the eastern side of the fairway, with the summit of Nalunga island bearing 270°.

Charts 2391, 3824.

Tidal streams.—In Guimaras strait the tidal streams follow the general trend of the channel. Normally the greatest rate in the

Charts 2391, 3824.

vicinity of Pandan point is about 2 knots, the streams in both directions being about equal, but during the South-west monsoon, the flood sometimes attains a rate of 6 knots.

The north-going stream which sets through Iloilo and Guimaras straits meets a branch of the stream which sets along the north coast of Panay and thence southward along the east coast, at Pan de Azucar island.

Chart 2391.

ILOILO STRAIT.—The south-western entrance to Iloilo strait has been described on page 336.

Pilots.—Pilots will board vessels on request by radio in the vicinity of red conical buoy, No. 2, situated about one mile northward of Navalas point (page 362).

North-eastern entrance. — Dangers. — Buoyage. — Light. — The north-eastern entrance to Iloilo strait is divided into two channels by Iguana bank, an extensive sandy shoal, with a least depth of 4 feet ($1^{m}2$) over it.

The northern shore is bordered with mangroves and fringed by a bank with depths of from one to 3 feet ($0^{m}3$ to $0^{m}9$) over it, extending from about half to three-quarters of a mile and is steep-to. A bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends from about 2 to 4 cables from the southern shore. Bantigui rocks, above water, lie on the coastal bank about one cable northward of Bantigui point, situated about 2½ miles north-westward of Navalas point.

Iguana bank is marked at its north-western edge by a black can buoy, No. 3, and about a quarter of a mile westward of its southern edge by a red conical buoy, No. 2. The bank is covered by the *red* sector of Siete Pecados light between the bearings of 278° and 304°. A narrow ridge, with a least depth of 2¾ fathoms ($5^{m}0$) over it, lies just outside the southern limit of this sector, from about 2 to 3 miles south-eastward of the lighthouse.

Of the two channels mentioned above, the northern is generally used. A third channel, sometimes used by small vessels, is northward of the bank and southward of the lighthouse, and thence round the northern end of Guimaras island, but care should be taken to avoid the 3½-fathom ($6^{m}4$) patch situated about 5 cables south-eastward of the lighthouse (*see* page 368). In the northern channel, in 1933, s.s. *Kirishima Maru*, drawing 18 feet ($5^{m}5$), reported having grounded about 1½ miles south-south-eastward of Dumangas point.

The least depth in the fairway of the northern channel is 20 feet ($6^{m}1$), and of the southern channel, 19 feet ($5^{m}8$) at the north-western end, situated about 6 cables north-north-eastward of Bantigui point.

Siete Pecados (*Lat. 10° 46′ N., Long. 122° 40′ E.*) are a group of rocky islets covered with small trees, lying in mid-channel between Panay and Guimaras island, north-westward of Iguana bank.

A light is exhibited, at an elevation of 85 feet ($25^{m}9$), from a white dwelling, on the largest islet of the Siete Pecados group.

A rock, with a depth of 13 feet ($4^{m}0$) over it, lies about 2 cables northward of Siete Pecados lighthouse. Two rocks, with depths of 8 and 2 feet ($2^{m}4$ and $0^{m}6$) over them, lie about 1¾ and 2¾ cables, respectively, south-westward of the lighthouse. The latter rock is marked on its south-western side by a red can buoy.

Chart 2391.

A 3½-fathom ($6^{m}4$) patch was reported, in 1936, about 5 cables south-eastward of Siete Pecados lighthouse.

Cabugao (Kabugao) point, the north-western extremity of Guimaras island, is a rocky bluff; there are no dangers lying more than a quarter of a mile offshore in this vicinity.

The shores south-westward of Cabugao point have been described on page 338.

Charts 3822, 3824.

DIRECTIONS.—Jintotolo channel to Iloilo.—From 2 miles southward of Jintotolo island a vessel should steer to pass between Cucaracha shoal and the 4-fathom ($7^{m}3$) shoal about 6 miles east-north-eastward of it; when the western hill, 1,129 feet ($344^{m}1$) high, on Sicogon island, bearing 183°, is just open eastward of the hill on the eastern side of Cañas islet, she should alter course southward on to this leading line. This is the channel generally used by coasting steamers, and leads between Balbagon island and the 3-fathom ($5^{m}5$) shoal westward of it. When the northern end of Tulunanuan island is abeam she should steer about 158°, passing about 1¼ miles eastward of Carmencita shoal, until Baliguian islet bears 180°, when she should steer for it on that bearing, passing about one mile eastward of the 9-foot ($2^{m}7$) patch lying 7¾ miles eastward of the eastern point of Pan de Azucar island. When about 2 miles northward of Baliguian islet she should alter course to pass westward of it, and then steer about 234° and pass between Anauayan islet and Ilacaon reef, and thence half a mile northward of Turia rock.

Chart 3824.

After passing Turia rock the vessel should steer to pass north-westward of Tomonton shoal and thence alter course southward and keep in the fairway for about 16 miles.

Chart 2391.

When Siete Pecados lighthouse bears 314° she should steer for it on that bearing, taking care at night not to get into the *red* sector of the light, and to avoid the 3½-fathom ($6^{m}4$) patch situated 5 cables south-eastward of the lighthouse. She should then pass southward of the red can buoy marking the sunken rock south-westward of the lighthouse, and when Jaro church, which is prominent, situated about 2½ miles north-westward of the entrance to Iloilo river, bears 247½ she should steer for it on that bearing until Bondulan point (page 337) bears 220°, which bearing leads in mid-channel between Jaro and Dapdap points, situated about 4 miles north-eastward, to the anchorage off the mouth of Iloilo river. *See* page 338.

The least depth on this route, which is the only one from north-eastward now used, is 3¾-fathoms ($6^{m}9$) at the entrance eastward of Navalas point (*Lat. 10° 43′ N., Long. 122° 42′ E.*).

Charts 3808, 3809, 943, 1263.

CHAPTER IX

VERDE ISLAND PASSAGE TO SAN BERNARDINO STRAIT—MARINDUQUE, BURIAS, TICAO AND MASBATE ISLANDS—PORT CEBU TO SAN BERNARDINO STRAIT

Chart 3817.

TAYABAS BAY.—Tayabas bay, on the southern side of Luzon, is entered between Bantigui point, 3¾ miles north-eastward of Locoloco point (page 317), and Tuquian (Tukian) point, about 44 miles eastward of Bantigui point.

Climate and weather.—*See* page 16.

Charts 3816, 3817.

Western side of Tayabas bay.—Dangers.—Bantigui point, a wooded headland about 350 feet ($106^{\mathrm{m}}7$) high, is a prominent landmark when entering the bay. It is steep-to on its southern and eastern sides, but its northern side is fringed by a coral reef which gradually widens as it approaches Coloconto bay.

Chart 3816.

Mount Banahao lies about 23 miles northward of Bantigui point (*Lat. 13° 41′ N., Long. 121° 28′ E.*) and 12 miles from the head of Tayabas bay. It is a truncated cone, 7,144 feet ($2{,}177^{\mathrm{m}}5$) high, and is prominent when not obscured by clouds.

Charts 3816, 3817.

Coloconto (Kolokonto) bay, entered between the northern side of Bantigui point and Subuquin (Subukin) point, about 2¼ miles north-westward, is foul and affords no anchorage; in the entrance to the bay there is a small wooded islet. Good anchorage may be obtained by vessels with local knowledge about half a mile outside the entrance protected from south-westerly winds.

Between Subuquin point and the mouth of Nayon river, about 5½ miles northward, and thence to the mouth of Tayabas river, 10 miles north-eastward the coast is low and wooded, and bordered by sand beaches which are intersected by small streams. There is a depth of about 3 feet ($0^{\mathrm{m}}9$) on the bar of Nayon river, increasing inside to 9 feet ($2^{\mathrm{m}}7$); it affords shelter to small craft with local knowledge. San Juan (Bolbok) is a small town situated about 4 miles westward of the mouth of the river.

There are several shoals in the western part of Tayabas bay, lying from about half a mile to 1¾ miles offshore. The coastal bank, with a depth of 7 feet ($2^{\mathrm{m}}1$) at its outer edge and steep-to, extends about three-quarters of a mile offshore and 3 miles northward of Subuquin

Charts 3806, 3807, 943, 2661b, 1263.

Charts 3816, 3817.

point. A dangerous coral reef, with a depth of 9 feet (2^{m}7) over it, and steep-to, lies about one mile south-south-eastward of the southern entrance point of Nayon river, and another reef, with a depth of 3 feet (0^{m}9) over it, lies about 2¾ miles north-eastward of the same point and three-quarters of a mile offshore.

Anchorage.—Vessels with local knowledge may obtain anchorage between Coloconto bay, and the mouth of Tayabas river, a quarter of a mile offshore, in a depth of 12 fathoms (21^{m}9), mud, avoiding the vicinity of the above-mentioned dangers, as they cannot be discerned on account of the muddy water.

Chart 3697.

Head of Tayabas bay.—Tayabas river is three-quarters of a cable wide at its entrance and has a depth of about one fathom (1^{m}8) on its bar at high water, increasing to 2 fathoms (3^{m}7) inside.

Lucena anchorage.—Danger.—Good anchorage may be obtained at Lucena anchorage southward of the mouth of Tayabas river, in a depth of about 7 fathoms (12^{m}8), mud and sand, with Tayabas point, the eastern entrance point, bearing about 061°, or closer inshore, in a depth of 5 fathoms (9^{m}1). The anchorage is protected by Tayabas point from north-easterly winds and by a reef, on which are several rocks above water, extending south-eastward from that point.

A shoal, with depths of from 2½ to 5 fathoms (4^{m}6 to 9^{m}1) over it, lies from one to 1½ miles south-south-westward of Tayabas point.

Lucena.—Lucena, a town of considerable importance, connected with Manila by railway, is situated about 2½ miles from the coast between two small rivers, which uniting lower down, form Tayabas river. Lucena is connected to the general telegraph system.

Radio station.—There is a radio station at Lucena. *See* page 14.

Coast.—Between Tayabas point (*Lat. 13° 54′ N., Long. 121° 37′ E.*) and Bocboc (Bokbok) point, the western entrance point of Pagbilao bay, about 5½ miles east-north-eastward, an extensive reef, which partly dries, extends southward for as much as 3¾ miles ; between the eastern edge of the reef and Pagbilao Grande island there is a deep channel, with a least width of about 4 cables between the dangers on either side, leading into Pagbilao bay.

Pagbilao bay.—The anchorage space in Pagbilao bay is contracted by shallow water which extends from all sides. Angas point, about 2¼ miles northward of Bocboc point, is about 25 feet (7^{m}6) high and bare, and may be easily identified. Pagbilao church, about 1¼ miles north-westward of Angas point, is visible from a considerable distance and is a good landmark. Patayan island, about 90 feet (27^{m}4) high, lies about three-quarters of a mile south-eastward of Angas point, and is prominent.

Pagbilao Grande island is nearly joined to the coast of Luzon at its north-eastern point. Mount Mitra, 530 feet (161^{m}5) high, situated in the north-eastern part, is the summit of the island. The southern point is steep-to at a distance of about 1¾ cables. Vessels should steer for this point when approaching Pagbilao bay.

Pagbilao Chica island is joined at its north-western end to the eastern side of Pagbilao Grande island by a ridge of sand. South-westward of this connection is Capulaan (Kapulaan) bay formed between the two islands, affording good sheltered anchorage during the North-east monsoon, in depths of from 5 to 13 fathoms (9^{m}1 to 23^{m}8).

Charts 3807, 943, 2661b, 1263.

Chart 3697.

Mount Lipata, near the southern end of the island, is 599 feet (182^{m}6) high, with a large white patch on the south-western side, near the summit, which is very prominent and may be seen for a distance of 20 miles in clear weather.

Anchorage.—Directions.—Good anchorage may be obtained, in a depth of about 4½ fathoms (8^{m}2), with the summit of Patayan island bearing 347°, and Bocboc point, 230°. Small vessels may anchor farther westward where there is more shelter during south-westerly winds.

To enter Pagbilao bay a vessel should give the south-western side of Pagbilao Grande island a berth of about a quarter of a mile and steer for Angas point bearing 335°, open westward of Patayan island.

Port Laguimanoc.—Port Laguimanoc (Laguimanok), lying eastward of the Pagbilao islands, is reduced by reefs and islets on both sides and at its head to a channel about half a mile wide, in which the depths decrease from 11 to 2 fathoms (20^{m}1 to 3^{m}7), sand and mud. Two shoals, with depths of 2 and 1½ fathoms (3^{m}7 and 2^{m}7) over them, lie on the western side of the entrance, about one mile and three-quarters of a mile, respectively, southward of Nang point, the eastern extremity of Pagbilao Chica island, and reefs which extend from both sides of the entrance, narrow the channel considerably.

Mangayao island is a wooded island lying on the eastern side of the entrance to Port Laguimanoc, about 1¼ miles eastward of Nang point. It is surrounded by mud flats which dry, which connect it to the coast of Luzon at low water. The northern part of the island is fringed with mangroves; the southern part is a sandy beach. Tubig point, the south-western extremity, is a low bluff fringed by rocks. A reef, which partly dries and on which there are some rocks, extends 1¼ miles southward from the southern side of the island.

High islet, 65 feet (19^{m}8) high, and steep-to on its western side, lies on the eastern side of the channel, 6¾ cables north-westward of Tubig point. A reef extends about 2 cables from the southern side of the islet. Calaba (Kalaba) islet, 40 feet (12^{m}2) high, lies about 3½ cables northward of High islet. Talaban islet, 39 feet (11^{m}9) high, and wooded, lies at the head of the navigable channel, about one mile north-north-westward of Calaba islet.

Laguimanoc (Laguimanok) point (*Lat. 13° 55′ N., Long. 121° 48′ E.*), the western extremity of the land on the eastern side of Port Laguimanoc, is composed of low bluffs fringed by rocks; it is 137 feet (41^{m}8) high, and well wooded. Laguimanoc (Laguimanok) village is situated on the point.

Anchorage.—Directions.—Anchorage may be obtained by small craft southward of Talaban islet according to draught, or close northward of Laguimanoc point.

To enter Port Laguimanoc a vessel should steer with Calaba islet in line with Laguimanoc point, bearing 357°, until Tubig point is abeam, when the shoals on the western side of the entrance will have been passed; then she should steer for the western extremity of Talaban islet, bearing 338°, and anchor according to draught.

Chart 3817.

North-eastern side of Tayabas bay.—Anchorages.—Lights.—Dangers.—The south coast of Luzon, from the entrance to Port Laguimanoc to Tuquian point, 29 miles south-eastward, is generally

Charts 3807, 943, 2661b, 1263.

low, with a flat sand beach, fringed with reefs and interspersed by mangroves. The country is thinly wooded near the coast, with scattered patches of cultivated ground. Farther inland low and heavily-wooded hills begin.

Anchorage may be obtained by vessels with local knowledge nearly anywhere along this coast, but the principal places are Unisan, Pitogo, and Macalelon (Makalelon) (*see* below). Vessels not intending to make a stay on this part of the coast should give it a berth of at least 2½ miles, as dangerous detached reefs lie nearly that distance offshore.

A prominent bare red bluff marks the point about 2 miles eastward of Mangayao island. Malatandan point, about 9 miles south-eastward of the eastern entrance point of Port Laguimanoc, is 179 feet ($54^{m}6$) high, bold, rocky and wooded; the land in the vicinity is low and level. The western side of the point is steep-to, but from the southern side a coral reef extends about half a mile. About three-quarters of a mile west-south-westward of the point is the north-eastern extremity of a reef which is awash at its south-western end.

Calaylayan (Kalaylayan) bay lies immediately south-eastward of Malatandan point. The head of the bay is shallow, and there is a wide sandy beach which dries. The town of Unisan, an occasional port of call for coasting steamers, is situated at the head of the bay. The small river which flows into the bay at the town, has a very shallow bar.

Good anchorage may be obtained by vessels with local knowledge during the North-east monsoon, in a depth of 4 fathoms ($7^{m}3$), soft mud, with the town bearing 035°, on which bearing the anchorage should be approached, and Malatandan point, 332°.

Silancapo (Silankapo) point (*Lat. 13° 48′ N., Long. 121° 59′ E.*), about 2½ miles south-south-eastward of Malatandan point, is low and generally fringed with mangroves at its extremity, but rises to an elevation of 295 feet ($89^{m}9$) at a distance of about 1¼ miles north-north-eastward. Mabio point, about 4¾ miles east-south-eastward of Silancapo point, is low, covered with mangroves, and fringed with coral. Between these two points the coast is bordered with sandy beaches alternating with mangroves; about midway a stream discharges and near its mouth are some prominent black rocks, about 8 feet ($2^{m}4$) high. A 7-fathom ($12^{m}8$) patch lies 3½ miles west-south-westward of Silancapo point, and a 39-foot ($11^{m}9$) patch lies 1½ miles southward of the point. A reef, with a depth of 4 fathoms ($7^{m}3$) over it, lies about 1¾ miles west-south-westward of Mabio point. A 13-foot ($4^{m}0$) patch lies about 2 miles westward of the point and 1¼ miles offshore. Between the latter shoal and the coast there are other reefs.

Pitogo, the principal town in this vicinity, is situated at the head of a bight between Mabio point and Pagbabaugnan point, about 2¾ miles eastward. The town stands on a point of land between the mouths of Lagalag and Mayuboc (Mayubok) rivers. The church is a prominent stone building with a tower on its eastern end. About 1¼ miles south-westward of Pagbabaugnan point is an extensive coral reef, which dries, and about a quarter of a mile southward of the western extremity of this reef is a 9-foot ($2^{m}7$) patch which is steep-to, lying 1¾ miles offshore. There is a small mole extending south-eastward from the town.

Good anchorage may be obtained by vessels with local knowledge, in a depth of 5 fathoms ($9^{m}1$), with the church at Pitogo bearing

Chart 3817.

045°, distant about three-quarters of a mile. Small vessels may anchor closer in, taking care to avoid a 7-foot (2^{m}1) patch about 4 cables southward of the town.

Coasting steamers call regularly.

A light is exhibited, at an elevation of 79 feet (24^{m}1), from a white concrete tower, at Pitogo.

Macalelon is a small town at the mouth of the small river of the same name which discharges about 2¼ miles south-eastward of Pagbabaugnan point. There is regular steamer communication with other ports.

Several detached reefs lie within 2 miles of the coast in this vicinity. A reef, with a depth of 13 feet (4^{m}0) over it, lies about 2½ miles south-south-westward of Macalelon and 1¼ miles offshore. The coastal bank, which dries, abreast the town, extends 1¼ miles offshore.

Vessels with local knowledge may obtain anchorage, in a depth of not less than 7 fathoms (12^{m}8), with the light-tower in Macalelon bearing 046°.

A light is exhibited, at an elevation of 48 feet (14^{m}6), from a white concrete tower, on the northern side of the entrance to Macalelon river.

About 4¼ miles south-south-eastward of Macalelon (*Lat. 13° 45′ N., Long. 122° 08′ E.*) is Hingoso village, where coasting steamers call regularly. Vessels with local knowledge may obtain anchorage with the village bearing 090°.

South-westward and southward of Hingoso and from one to 1½ miles offshore, is a chain of detached reefs and a rock awash.

Tuquian (Tukian) point is low, covered with mangroves, and fringed by a reef which extends about 3½ cables westward and about 6½ cables southward.

WESTERN SIDE OF BONDOC PENINSULA.—Coast.— Between Tuquian point and Ajus (Ahus) point, about 9 miles east-south-eastward, are Tagabas and Catanauan (Katanauan) bays, separated by Sandoval point.

Tagabas bay has a depth of 7 fathoms (12^{m}8) in its entrance and shoals gradually towards the head. It affords the safest anchorage for vessels with local knowledge on the Luzon coast between Port Laguimanoc and Ragay gulf.

Puting Buhangin (Bubangin) shoal is a detached coral reef, which dries, lying about three-quarters of a mile west-south-westward of the western extremity of Sandoval point. A shifting sandbank on the reef dries about 2 feet (0^{m}6). There is shoal water eastward of the reef, with a channel for small vessels between it and the point. A shoal, with a depth of 3 fathoms (5^{m}5) over it, lies about one mile west-south-westward of Puting Buhangin shoal, with greater depths between. These shoals partially protect Tagabas bay from south-westerly seas.

To enter Tagabas bay, a vessel should bring the northern side of the western extremity of Sandoval point to bear 090°, before Tuquian point bears 000°. When Puting Buhangin shoal is abeam, she should alter course north-eastward and anchor according to draught.

Sandoval point is low, densely wooded, and fringed with mangroves; it is bordered by reefs, which dry, which do not extend more than 3½ cables offshore. It is connected with the mainland by an isthmus less than half a mile wide.

Charts 3807, 943, 1263.

Chart 3817.

Catanauan bay. — Light. — Anchorage. — Catanauan bay is entered between Sandoval point and Pala point, 2¾ miles east-south-eastward. A reef, on which are several rocks, which dry about 2 feet (0^{m}6), extends about 3½ cables south-eastward from the eastern extremity of Sandoval point, and a reef extends about a quarter of a mile westward from Pala point. Inside the entrance the coral reefs decrease in width and finally disappear, leaving a sandy beach along the shore of the bay. There are no dangers in the bay except the reefs fringing the shores. Catanauan river discharges into the head of the bay and affords shelter to small craft with local knowledge, but the entrance is encumbered by a sand bar which dries. There is a small pier close inside Pala point.

Catanauan (Katanauan), the largest town in this vicinity, is situated at the mouth of the river of the same name. A church of grey stone with a small dome, is a good landmark. There is occasional steamer communication with other ports.

A light is exhibited, at an elevation of 36 feet (11^{m}0), from a white concrete tower, at Catanauan (*Lat. 13° 35′ N., Long. 122° 19′ E.*)

Vessels entering usually approach with the light-tower bearing 023° and anchor in a depth of 5 fathoms (9^{m}1), sand, one mile distant. Small craft may anchor closer in.

Between Pala point and Ajus point, the fringing coral reef extends about 4 cables offshore, and outside it the bottom is sand, sloping steeply to mud. Less than half a mile south-westward of Ajus point is a detached coral patch, which dries ; this is the only off-lying danger in the vicinity.

Mompog pass.—Mompog pass lies between Tuquian point and Maniuayan and Mompog islands. In it the tidal streams set generally north-westward and south-eastward, but there are strong and irregular currents both in the pass and between it and Bondoc point, the southern extremity of Bondoc peninsula, so that caution is necessary when navigating in this vicinity.

Mompog island, 282 feet (85^{m}9) high, and steep on the eastern side, lies about 4¾ miles south-south-westward of Tuquian point. It is fringed on its northern, eastern, and southern sides by a narrow, steep-to reef ; on the western side the reef extends farther offshore. The channel between Mompog island and Maniuayan island, westward of it, is about 1¼ miles wide between the 5-fathom (9^{m}1) lines, with a least depth of 27 feet (8^{m}2) in the fairway, but the rocky bottom is very uneven. For directions for proceeding through this channel, and for the description of Maniuayan island, *see* page 380.

Coast.—Dangers.—Anchorages.—About 3 miles northward of Catanauan bay a range of heavily-wooded hills commences and extends in a south-south-easterly direction, gradually increasing in elevation to 675 feet (205^{m}7). They approach the coast near Ajus point, and border it as far as Ayoni bay, about 11 miles south-eastward. Between Mulanay (Mulanai), 3¼ miles south-eastward of Ajus point, and Mataha river, 4¾ miles south-eastward, the hills, from about 300 to 700 feet (91^{m}4 to 213^{m}4) high, come close to the beach, which is steep-to. From Ayoni bay, southward, they recede, and the country is more open, wooded, and grassy, and 3 or 4 miles inland rises to a range of mountains, mostly wooded, from 1,200 to 1,400 feet (365^{m}8 to 426^{m}7) high.

Charts 3807, 943, 1263.

Chart 3817.

Mulanay is a small town at the mouth of the river of the same name; the coastal reef between them does not extend more than half a mile offshore. Good anchorage may be obtained by vessels with local knowledge, but protected only during the North-east monsoon, in a depth of 5 fathoms ($9^{m}1$), sand, about 4 cables offshore, with the church, which has a high white tower, bearing 070°. Vessels should approach the anchorage on this bearing, and anchor when a large rock on the northern side is abeam.

Mount Maclayao (Maklayao), about 2 miles eastward of Mulanay, is a broad, flat-topped, densely wooded summit, 1,240 feet ($378^{m}0$) high; it rises only slightly above the other hills in its vicinity.

Close southward of Mulanay the coastal reef extends about 3¼ cables offshore, but thence to the mouth of Mataha river, the reef is narrow and very steep-to. The land along this coast rises steeply to elevations of from 300 to 700 feet ($91^{m}4$ to $213^{m}4$). Lipata point, 2¼ miles south-south-eastward of Mulanay, may be identified by its white cliffs.

Ayoni bay is an open roadstead which affords good anchorage during the North-east monsoon to vessels with local knowledge. The depths decrease gradually from 15 fathoms ($27^{m}4$), mud, one mile offshore, to 5 fathoms ($9^{m}1$), sand, half a mile offshore. A reef extends about half a mile from the southern entrance point of the bay. From this point to Subunguin point (*Lat. 13° 18′ N., Long. 122° 31′ E.*), about 6 miles southward, the coast is generally fringed with coral or rock, which extends in places more than half a mile offshore. Detached reefs, with depths of from 3 to 30 feet ($0^{m}9$ to $9^{m}1$) over them, lie from half a mile to 1½ miles offshore.

Charts 3817, 3818.

Aurora (Bondok) village, partially obscured by trees, is situated about 3 miles northward of Subunguin point. The church, standing in the northern part of the village, is readily identified, being the largest building in it. Good anchorage may be obtained during the North-east monsoon by vessels with local knowledge, in depths of 9 or 10 fathoms ($16^{m}5$ or $18^{m}3$), mud and sand, about three-quarters of a mile offshore, off the village. The depths decrease rapidly from 5 fathoms ($9^{m}1$) towards the coast. Small craft may anchor closer in by following the narrow channel through the coastal reef.

Two reefs, with depths of 28 and 30 feet ($8^{m}5$ and $9^{m}1$) over them, lie about 1¼ and 1¾ miles, respectively, westward of Aurora church.

A vessel approaching Aurora from northward should keep at least one mile from the coast until the church bears 100°, when she should steer for it on that bearing and anchor as previously directed. A vessel from westward should pass southward and eastward of Subunguin reef, and approach the anchorage with the church bearing 068°.

Subunguin point, about 250 feet ($76^{m}2$) high, and wooded, is bordered with mangroves, and fringed by a reef, which, on the western side, is very narrow and steep-to.

Off-lying danger.—Subunguin reef, which partly dries about 2 feet ($0^{m}6$), lies about 3 miles north-westward of Subunguin point, and is steep-to on its western side. The channel between this reef and the reefs westward of Aurora is one mile wide, deep, and clear of dangers.

Coast.—Aguasa bay, immediately southward of Subunguin point, is fringed at its head by a wide coral reef, which dries. A detached

Charts 3817, 3818.

reef, with a depth of 7 feet (2^{m}1) over it, lies off the entrance to the bay, about 9 cables south-south-westward of a steep cliff, about 100 feet (30^{m}5) high, on the south-western side of Subunguin point. Small vessels with local knowledge may obtain anchorage in the middle of the bay, in depths of from 3 to 5 fathoms (5^{m}5 to 9^{m}1), sand.

Pinamuntangan bay lies immediately northward of Pinamuntangan point, situated 3 miles southward of Subunguin point. There are several detached shoals in the northern part of the bay about 3½ cables offshore. There is a sandy beach at the head of the bay. Pinamuntangan point is densely wooded, bordered with mangroves, and fringed by a narrow reef. From this point to Bondoc point, 7½ miles south-eastward, the coast is bold and steep-to.

Chart 3818.

Bondoc (Bondok) point (*Lat. 13° 10′ N., Long. 122° 36′ E.*) is a redoubt-like formation of limestone, with a bluff about 50 feet (15^{m}2) high, rising from a platform of old coral; on account of it being remarkably bold, grey in colour and appearing like masonry, makes it easy to identify. It is clear of dangers and steep-to. Bondoc (Bondok) head, about 1½ miles north-north-westward of Bondoc point, is 1,329 feet (405^{m}0) high.

Chart 3817.

MARINDUQUE.—The island of Marinduque, lying between Bondoc peninsula and the eastern entrance to Verde Island passage, is mountainous and well wooded. There are several prominent peaks, of which Mount Marlanga, in the southern part of the island, 3,877 feet (1,181^{m}7) high, is the highest.

There are five towns, all of which are on or near the coast, and off which sheltered anchorage may be obtained according to the season. There are three harbours of refuge, Port Balanacan, Santa Cruz, and Masagasai bay, where there is good shelter. The soil is fertile, and the principal exports are hemp, copra, and firewood.

Western side of Marinduque.—Coast.—San Andres point, the northern extremity of the island, is the termination of a steep-to peninsula, 886 feet (270^{m}0) high. San Andres islands are two islands, 130 and 135 feet (39^{m}6 and 41^{m}1) high, extending about one mile westward from Silangan point, the north-western extremity of the island. They are fringed with a narrow steep-to coral reef which dries. There is no channel between them, and at very low tides the reef which connects them with the point dries. There are tide-rips immediately westward of the islands.

Chart 3559, plan of Port Balanacan.

Port Balanacan. — Islets and dangers. — Light. — Port Balanacan, entered between Antagtacan point, situated 1½ miles southward of Silangan point, and Pamuntangan point, about 1¼ miles farther southward, consists of two small but perfectly protected anchorages for moderate-sized vessels. It is backed by high hills, and except for one reef in the entrance, is free from dangers.

Antagtacan point is 244 feet (74^{m}4) high and well wooded. Pamuntangan point is 320 feet (97^{m}5) high 2¾ cables within its extremity, and well wooded. Fronting the northern side of the entrance are Agpitan and Ataa islets lying on the same reef; they are dome-shaped, about 50 feet (15^{m}2) high, and wooded at their summits. A pinnacle rock,

Charts 3807, 943, 2661b, 1263.

Chart 3559, plan of Port Balanacan.

8 feet ($2^{m}4$) high, lies near the outer edge of the reef extending south-westward from Ataa islet.

Madumug islet, on the northern side of the entrance, is 145 feet ($44^{m}2$) high, and wooded. It lies on the outer edge of a reef which extends from the northern shore of the port. On its western side is a light brown cliff, about 90 feet ($27^{m}4$) high.

A detached reef, on the eastern edge of which is a rock which dries, lies from 1½ to 2½ cables south-westward of Madumug islet, and on the northern side of the fairway into the port; it does not show up well.

Salvaria islet (*Lat. 13° 32′ N., Long. 121° 52′ E.*) lies on the eastern side of the entrance to the inner basin; it consists of a pile of rocks with a few trees on it, and is steep-to on its western side, but there is shallow water between it and the eastern shore of the port.

Balanacan village is situated on the eastern shore of the port, eastward of Madumug islet, and about 1¼ cables northward of the village is a prominent yellow bluff, which is a useful mark for vessels entering the port.

A light is exhibited, at an elevation of 45 feet ($13^{m}7$), from a white concrete column, close northward of the yellow bluff on the eastern side of Port Balanacan.

Anchorages.—Directions.—Anchorage may be obtained about 1½ cables eastward of Madumug islet, in a depth of 11 fathoms ($20^{m}1$), mud, or in the middle of the inner basin, 2 cables north-eastward of Salvaria islet, in a depth of about 7 fathoms ($12^{m}8$), mud.

A vessel entering Port Balanacan should pass about 1¼ cables northward of Pamuntangan point and steer eastward until the light-column, on the eastern shore bears 060°, when she should steer for it on that bearing until the western extremity of Salvaria islet is in line with Pig point, about a quarter of a mile north-north-eastward of it, bearing 019°, when she should keep these marks in line, which will lead to the outer anchorage, or continue on this line, passing close westward of Salvaria islet and thence to the anchorage in the inner basin.

Chart 3817.

Coast. — Lights. — Anchorages. — Ulan bay, entered between Pamuntangan point and Ulan point, about 1¼ miles south-south-westward, is encumbered by reefs which dry. Ulan point is fringed by a coral reef, which extends about 3½ cables offshore; this is the outermost danger on the western side of Marinduque. Southward of Ulan bay the coast is low. Lupac (Lupak) point, the western extremity of the island, is low, flat and sandy, and is bordered with coconut palms.

Boac (Boak) river divides about one mile inland, the main branch discharging close southward of Lupac point, while Laylay, the smaller stream, flows south-westward and discharges at Laylay village, about half a mile south-eastward of the mouth of Boac river. Laylay village is the usual landing place for Boac; boats can enter Laylay river at high water; there is also a concrete landing place about one cable southward of the light-structure, but there is only a depth of 2 feet ($0^{m}6$) alongside.

Boac (Boak), the principal town on the island, and capital of the province of Marinduque, lies on the southern side of Boac river, about 1½ miles from the coast. It is connected by telephone with Gasan and Torrijos.

Charts 3807, 943, 2661b, 1263.

Chart 3817.

The usual anchorage is from about 2½ to 3½ cables westward of the light-structure, in depths of from 12 to 15 fathoms ($21^{m}9$ to $27^{m}4$). This anchorage must be approached cautiously as the depths decrease rapidly.

A light is exhibited, at an elevation of 28 feet ($8^{m}5$), from a white concrete tower, on the beach at the mouth of Laylay river.

Obung point (*Lat. 13° 21′ N., Long. 121° 49′ E.*), 6¼ miles southward of Lupac point, is low and sandy. The town of Gasan is situated on a bluff, from 20 to 50 feet ($6^{m}1$ to $15^{m}2$) high, about 2 miles south-eastward of Obung point. A prominent white warehouse, with a galvanised iron roof, is situated near the beach in the northern part of the town. Behind the town is a hill with a ruined fort on it, on one of the walls of which is a prominent tree. Copra is the principal export from Gasan.

A light is exhibited, at an elevation of 37 feet ($11^{m}3$), from a white concrete tower, at Gasan.

A light is exhibited from the red roof of a warehouse, situated about three-quarters of a mile north-westward of Gasan light-tower.

Good anchorage, protected only during the North-east monsoon, may be obtained by vessels with local knowledge, in depths of 7 or 8 fathoms ($12^{m}8$ or $14^{m}6$), sand, about 4 cables westward of the town; vessels of light draught may anchor closer in.

The villages of Daiquitin (Daikitin) and Buenavista are situated on the coast about 7 and 9 miles, respectively, south-eastward of Obung point. Suban point, the southern extremity of Marinduque, is bold and clear of dangers; the land within this point rises steeply to Mount Marlanga, about 2½ miles northward. *See* page 376.

Elefante (Elephant) islet, about 4 cables southward of Suban point, is 386 feet ($117^{m}6$) high, sparsely wooded, and steep-to on all sides; it is well defined, especially from eastward or westward. The tidal streams between the island and Suban point run at a considerable rate.

Anchorage may be obtained by vessels with local knowledge on a small ridge northward of Elefante islet, in a depth of about 13 fathoms ($23^{m}8$), sand, with the eastern extremity of the islet bearing 180°.

Off-lying islands.—Light.—Tres Reyes islands are a group of three densely wooded, uninhabited islands, lying about 1¾ miles from the south-western side of Marinduque. Baltasar, the outer island, with an elevation of 355 feet ($108^{m}2$), is the highest of the group; inside it are Melchor and Gaspar islands. The islands are steep-to, except at the north-eastern point of Gaspar, from which coral and rocks extend about 1¼ cables. The coasts are bordered by precipitous cliffs underworn by the sea, and are highest on the south-western side of each island, where they reach an elevation of about 200 feet ($61^{m}0$).

The channels between the three islands are deep and clear of dangers, but between Gaspar island and the coast of Marinduque there is a 28-foot ($8^{m}5$) patch. The channel between it and Gaspar island is about three-quarters of a mile wide and deep, and that between the patch and Marinduque about half a mile wide and also deep.

A light is exhibited, at an elevation of 417 feet ($127^{m}1$), from a white steel circular tower, on the summit of Baltasar island.

Northern side of Marinduque.—Coast.—Between San Andres point (page 376) and Santa Cruz point, 8½ miles eastward, the coast is indented by Sayao and Calancan (Kalankan) bays, separated by

Charts 3807, 943, 2661b, 1263.

Chart 3817.

Trapichihan point. Sayao, the western bay, though fringed with rocks, is deep in the middle. Calancan bay is encumbered with shoals, and fronting its western end are the Banot islands, of which Hakupan, the outer island, lying about a mile north-eastward of Trapichihan point, is high and bold, but is not conspicuous except from close offshore. Lusok village is situated in the south-eastern corner of Calancan bay.

Chart 3559, plan of Santa Cruz harbour.

Santa Cruz point (*Lat. 13° 33′ N., Long. 122° 00′ E.*), on the western side of the northern entrance to Santa Cruz harbour, is over 100 feet ($30^{m}5$) high, and fringed on its northern extremity by a narrow reef. In this vicinity there are no outlying dangers northward of a line running east and west through Santa Cruz point, with the exception of a 15-foot ($4^{m}6$) patch about half a mile north-westward of the point, beyond which the depths increase rapidly. Foul ground extends about 3 miles east-south-eastward from Santa Cruz point, and forms the western side of the northern channel into Santa Cruz harbour.

Santa Cruz island, about 3¾ miles south-eastward of the point of the same name, is low and flat; the south-western part of the island is a mangrove swamp, and the remainder cultivated land and coconut groves. The island is fringed by reefs, which extend about half a mile northward from the north-western point and about 3½ cables south-eastward from the south-eastern point.

Santa Cruz harbour.—Light.—Santa Cruz harbour, formed by the passage between Marinduque and Santa Cruz islands, is safe and fairly capacious, has excellent holding ground, and is especially important as a harbour of refuge for vessels overtaken by bad weather when in this vicinity. The northern entrance is over half a mile wide between the reefs, and is deep; the eastern entrance, between the south-eastern end of Santa Cruz islands and the coast of Marinduque, is 2½ cables wide, with a least depth of about 8 fathoms ($14^{m}6$) in the fairway. On the southern side of the eastern entrance is a coral bank, with depths of from 15 to 18 feet ($4^{m}6$ to $5^{m}5$) over it, about 1¼ miles eastward of Mango point (page 380).

A light is exhibited, at an elevation of 24 feet ($7^{m}3$), from a white concrete tower, on the fringing reef on the western side of Santa Cruz harbour.

Santa Cruz river, which discharges into the south-western part of the harbour, is very shallow and navigable by small boats only at high water. The town of Santa Cruz is situated about three-quarters of a mile southward of the river, and about 1½ miles from its mouth. There is a warehouse with a small pier on the southern side of the river about 1¼ miles westward of Tabignan point, the northern entrance point. There is frequent steamer communication with other ports.

Tagum river, which is larger and has a greater depth inside than Santa Cruz river, discharges immediately eastward of that river. Off the mouth, however, there are extensive mud flats which dry, through which there is a channel with a depth of only one foot ($0^{m}3$).

Anchorages.—Directions.—Good protected anchorage may be obtained on the southern side of the harbour, in a depth of 9 fathoms ($16^{m}5$), soft mud, with the southern extremity of Santa Cruz island bearing 091°, and the south-western extremity of the same island, 335°. The usual anchorage for small craft desirous of communicating

Charts 3807, 943, 1263.

Chart 3559, plan of Santa Cruz harbour.

with Santa Cruz is south-eastward of Tabignan point. Vessels of not more than 7 feet ($2^{m}1$) draught may proceed into the narrow channel between two rocky reef points southward of Tabignan point, and anchor in a depth of from 1½ to 2 fathoms ($2^{m}7$ to $3^{m}7$), protected from all winds.

A vessel entering Santa Cruz harbour by the northern channel should not bring Santa Cruz point (*Lat. 13° 33′ N., Long. 122° 00′ E.*) to bear more than 270° until the eastern extremity of Santa Cruz island is well open of the northern extremity of that island, bearing 130°, in order to give the foul ground on the western side of the entrance a good berth. When the south-western tangent of Santa Cruz island bears 166°, and is in line with a bluff, not shown on the chart, situated near the mouth of Tagum river, she should haul southward and bring the light-structure on the western side of the harbour to bear 189°, and steer for it until well inside, when a mid-channel course may be kept to the anchorage.

A vessel approaching the eastern entrance should bring the light-structure to bear 282°, and steer for it on that bearing until Mango point, on the southern side, is abeam, when the course may be shaped for the desired anchorage.

Maniuayan island.—Maniuayan island, north-eastward of Santa Cruz island, is low, flat, given up exclusively to the cultivation of coconuts, and surrounded by extensive reefs, some of which dry. The channel between Santa Cruz and Maniuayan islands is three-quarters of a mile wide, with a least depth of 8 fathoms ($14^{m}6$) in mid-channel. On the western side of the channel is a detached shoal, with a reef, which dries, on its south-eastern part, situated half a mile from the north-eastern side of Santa Cruz island. Tagum point (*see* below) in line with the summit of the easternmost hill on Salomague island (chart 3817), bearing 159°, leads through the channel.

Chart 3817.

Mompog island, eastward of Maniuayan island, has been described on page 374. The eastern extremity of Salomague island (*see* below) in line with the slope of the third knoll on Salomague point, the eastern extremity of Marinduque, bearing 184°, leads through the channel between the two islands, in a least depth of 7 fathoms ($12^{m}8$). The alignment, which should be closely adhered to, leads eastward of the 27-foot ($8^{m}2$) patch, which lies in the fairway.

Chart 3559, plan of Santa Cruz harbour.

Eastern side of Marinduque.—Coast.—Tagum point, about 3½ miles south-eastward of Mango point, is steep-to. The land within the point rises in a steep slope to two hills known as the Tagum peaks, 532 and 584 feet ($162^{m}2$ and $178^{m}0$) high, respectively. From northward these hills appear to be sharp; the eastern and higher one is well defined and wooded, while the other is covered with grass and has some trees on its summit.

Chart 3817.

Several shoals, with depths of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$) over them, lie within 6 cables eastward and south-south-eastward of Tagum point.

Salomague island lies midway between Tagum point and Salomague point (*Lat. 13° 22′ N., Long. 122° 09′ E.*), and protects Masagasai bay. The north-western and south-eastern points are low, and there are

Charts 3807, 943, 1263.

hills in the centre and south-western part; the summit of the island, near the centre, is 242 feet (73^{m}8) high. On the south-eastern part is a brown, rocky cliff, about 120 feet (36^{m}6) high. The north-eastern side is fringed with reefs which extend about 3 cables offshore at the northern end, tapering to the rocky cliff just mentioned.

Masagasai bay, is an irregular indentation in the coast which is almost entirely occupied by Salomague island. The channel between the island and the coast of Marinduque is narrow and shallow in the middle westward of the centre of the island, but expands at either end, where there are greater depths. At the northern end anchorage may be obtained by small vessels, in depths of 4 or 5 fathoms (7^{m}3 or 9^{m}1).

To enter Masagasai bay a vessel should steer with the white stump, situated on the northern shore about 7 cables north-westward of the northern extremity of Salomague island, in line with the conical hill, 323 feet (98^{m}4) high, situated about 2 miles westward of the same point, bearing 260°, until Tagum point bears 017°, when she should steer 197° with the point astern until the conical hill bears 284°, and then steer for the anchorage.

Salomague point (*Lat. 13° 22′ N., Long. 122° 09′ E.*) is formed of low cliffs and is steep-to at a short distance.

The coast between Salomague point and Suban point is bold, clear of dangers and steep-to. A coral reef extends about 2 cables from close westward of Salomague point, and tapers to Marlanga bay (*see* below).

Torrijos bay, entered about 4¼ miles south-westward of Salomague point, affords shelter for small craft with local knowledge except from southerly and easterly winds, in a depth of about 7 fathoms (12^{m}8), sand, in the middle of the bay. The entrance points and sides of the bay are fringed with coral, narrowing the entrance to a width of about 1½ cables and contracting the anchorage to a width of about 1¼ cables. Torrijos is a small town of no commercial importance standing on high ground on the western side of the bay. The school buildings are visible seaward from most directions.

Marlanga bay, entered about 2¾ miles south-south-westward of Torrijos, is of no commercial importance. Anchorage may be obtained by vessels with local knowledge, in depths of from 12 to 15 fathoms (21^{m}9 to 27^{m}4), sand, about 4 cables from the beach.

Marlanga point, the south-eastern point of Marinduque, is a bold headland, 920 feet (280^{m}4) high at 2 cables inland.

Charts 3818, 3807.

RAGAY GULF.—Ragay gulf is entered between Bondoc point (page 374) and Cabarian point, about 43 miles east-south-eastward. With Viñas river, which discharges into the head of the gulf, it nearly separates the south-eastern part of Luzon from the main portion of that island. The gulf is, in general, deep and clear of dangers. The shores are fringed by narrow coral reefs interspersed with sand and gravel beaches. The hills rise steeply from the shore, and are generally wooded, the lower slopes and a few of the hill-tops being covered with tall grass and scattered trees. At the head of the gulf the land slopes more gradually from 2½ to 4 cables inland and then rises steeply. The water at the head of the gulf is generally muddy. The most important ports are Pusgo and Guinayangan on the western side of the gulf, and

Charts 3818, 3807.

Ragay bay, Caima bay and Pasacao anchorage (*Lat. 13° 30′ N., Long. 123° 03′ E.*) on the eastern side. Anchorage may be obtained by vessels with local knowledge almost anywhere near the shore, but not too close in, as in places rocks awash lie outside the shore reef. The entrance to the gulf is divided into two wide channels by the island of Burias and the islands and shoals off its north-western end.

Tidal streams.—The tidal streams from the China sea through Verde Island passage, and from the Pacific through San Bernardino strait, meet and neutralise each other nearly on the meridian of Bondoc point, or on the line between Bondoc point and Romblon island. It has been observed that on arriving off Bondoc point with a fair stream a reverse stream has been experienced on passing its meridian. The tidal hour of this point has not been determined.

Chart 3818.

Western side of Ragay gulf.—Coast.—Between Bondoc point and Arena point, 7 miles north-eastward, the coast is clear of dangers and steep-to, except for two reefs off Pagsanhan point, about 3 miles north-eastward of Bondoc point, the outer reef of which is awash and lies about half a mile south-eastward of the point. North-eastward of Bondoc point the hills decrease in elevation and become more grassy, until at Pagsanhan point they trend inland. Pagsanhan point is low and wooded at its extremity, and fringed by a narrow coral reef. Pagsanhan river, the largest stream in the vicinity, with a depth of about 4 feet ($1^{m}2$) on its bar, flows out close northward of Pagsanhan point. Talisay (Talisai) river, which discharges about 2 miles north-eastward of the mouth of the Pagsanhan river, is fronted by coral and encumbered with boulders.

A clump of trees on the first knoll northward of Arena point, is the most prominent landmark in this vicinity. Mount San Andres, 1,320 feet ($402^{m}3$) high, about 6 miles northward of the point, and another peak about 1¾ miles farther northward, are also prominent, their summits being covered with tall grass. Sombocogon (Sombokogon) bay, entered about 2¾ miles northward of Arena point, is partly filled at its head by a coral reef.

Off-lying islands and dangers.—Alibijaban (Alibihaban) island lies about 6 miles northward of Arena point and 2 miles from the eastern side of Bondoc peninsula. The northern and southern ends of the island are both wooded, and 160 and 65 feet ($48^{m}8$ and $19^{m}8$) high, respectively. The middle of the island is low and bordered by mangroves, giving it from a distance the appearance of two islands. The island is fringed by a coral reef, which extends three-quarters of a mile southward and a quarter of a mile northward.

Chart 3807.

Several detached shoals, with depths of from 1¼ to 4 fathoms ($2^{m}3$ to $7^{m}3$) over them, lie about one mile off the western side of the gulf and parallel with it, the southern shoal being situated 2¾ miles north-westward of the northern point of Alibijaban island.

Palad reef, 4¾ miles northward of Alibijaban island (*Lat. 13° 21′ N., Long. 122° 43′ E.*), has, near the middle, a cay which dries about 5 feet ($1^{m}5$). The channel between the reef and the coast westward is about 2 miles wide and in it are some patches, with depths of from 5½ to 10 fathoms ($10^{m}1$ to $18^{m}3$). A 6½-fathom ($11^{m}9$) patch lies about 2½ miles north-westward of the cay and 1¾ miles offshore.

Charts 943, 1263.

Chart 3807.

Pusgo reef, with a depth of 1½ fathoms (2m7) over it, lies about 1¼ miles south-south-eastward of Pusgo point, the south-eastern extremity of the peninsula, which forms the north-eastern side of Port Pusgo.

Port Pusgo.—Port Pusgo is a narrow inlet extending about 5 miles north-westward into the eastern side of Bondoc peninsula. The entrance, in which there is a least depth of 5½ fathoms (10m1) in the fairway, is narrowed to about half a cable by a mud bank extending from a projecting point of mangroves on the western side. The western and part of the eastern shore consists of mangroves. Buhangin village is situated on the north-eastern side of the entrance to the port, about 1¾ miles north-westward of Pusgo point, and the town of San Narciso stands at the head of the port. The port is shallow within 2 miles of its head.

Well protected anchorage may be obtained by vessels with local knowledge, in a depth of 4 fathoms (7m3), mud, about half a mile above Buhangin village.

Coast.—Gorda point, 1¼ miles north-north-westward of Pusgo point, is high and steep. The reef which fringes the south-western side of the peninsula forming the eastern side of Port Pusgo, extends around its south-eastern end to Gorda point, and projects from half a cable to 2 cables offshore. Two detached shoals, with depths of 2½ fathoms and 3 feet (4m6 and 0m9) over them, lie 4¼ and 5 miles, respectively, north-westward of Gorda point, and about 7 cables and one mile offshore.

Peris bay is entered between Guinhalinan point, about 11 miles north-westward of Gorda point, and Lian point, 4½ miles farther northward. Lian point, which rises to an elevation of about 300 feet (91m4) at less than half a mile within, is very prominent. A coral reef, which extends a quarter of a mile from Lian point, fringes the northern side of the bay. The head of the bay is fringed by a bank of mud which considerably reduces the available space. Peris river, navigable for small boats for 7 or 8 miles, discharges into the head of the bay. Good anchorage may be obtained by vessels with local knowledge, in depths of from 4 to 6 fathoms (7m3 to 11m0), mud, in the north-western part of the bay.

A shoal, with a depth of 2 fathoms (3m7) over it, lies 2 miles northward of Lian point, and half a mile offshore.

Off-lying shoal.—A shoal, with a depth of 5½ fathoms (10m1) over it, lies 5¾ miles eastward of Guinhalinan point.

Chart 3818.

Eastern side of Ragay gulf.—Coast.—Dangers.—Cabarian point, the eastern entrance point of Ragay gulf, is low and wooded, but it may be identified by a hill, 307 feet (93m6) high, about half a mile northward of it. A coral reef extends about one cable from the point.

Macoto (Makoto) point, bold and prominent, lies about 4 miles north-westward of Cabarian point. Three wooded hills on the point, the highest having an elevation of about 240 feet (73m2), and the low land between them give the point the appearance of an island from northward or southward. Bagadamolag islet lies southward of the point close off the fringing reef.

Cagmanaba (Kagmanaba) bay, on the southern side of Macoto point (*Lat. 13° 04′ N., Long. 123° 17′ E.*), affords shelter for vessels with local

Charts 943, 1263.

Chart 3818.

knowledge from all winds except those from southward. A hill, 105 feet ($32^{m}0$) high, close to the shore near the head of the bay, and Mount Caburauan (Kaburauan), 1,552 feet ($473^{m}0$) high, 3 miles eastward of Macoto point, are useful marks.

A shoal, with a depth of 13 feet ($4^{m}0$) over it, lies nearly one mile north-westward of Macoto point.

Between Macoto point and Pasacao anchorage (chart 3807), about 30 miles north-north-westward, the coast is high, steep-to, and generally bordered by a sand beach.

Between Macoto point and Apud point, about 5 miles northward, the coast is bordered with cliffs, from about 12 to 80 feet ($3^{m}7$ to $24^{m}4$) high. Apud point is low and covered with mangroves, brushwood and scattered coconut palms. Apud reef is an extensive rocky reef, which dries, lying on a bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extending about 1½ miles offshore, north-westward of Apud point; the channel between them is about 3½ cables wide with a 16-foot ($4^{m}9$) patch in mid-channel north-westward of the point, to which it is connected by a ridge with a greater depth over it. In the channel westward of the patch there is a depth of 8 fathoms ($14^{m}6$). A rock, awash, lies three-quarters of a mile north-north-westward of Apud reef.

Vessels with local knowledge may obtain fairly good protection under the lee of Apud reef, but they should anchor well towards the point.

Caunbalan (Kaunbalan) point, about 2½ miles north-north-eastward of Apud point, is high, with a number of large rocks at the foot of the cliffs; it is fringed by a coral reef. Mount Pantao, 1,510 feet ($460^{m}2$) high, lies about 3¼ miles east-south-eastward of Caunbalan point and is easily identified. Pantao bay, lying immediately northward of Caunbalan point, affords good anchorage for vessels with local knowledge, but it is open north-westward. An outcrop of light-coloured rock forming a vertical cliff, 118 feet ($36^{m}0$) high, at the top of the ridge covered with tall grass, about 2½ miles northward of Pantao bay, is a good mark.

Bedal point, about 5½ miles north-north-westward of Caunbalan point, is fringed by coral, and a coral reef, awash, lies about 2¾ cables southward of it. This is the only danger along this coast northward of Pantao bay. Coguit (Koguit) point, 2 miles north-westward of Bedal point, is low and covered with brushwood; it is bordered by a sandy beach and fringed by a coral reef extending about a quarter of a mile offshore. A prominent hill covered with tall grass, lies between the point and the higher ridge inland. Caurusan (Kaurusan) point, about 4 miles northward of Coguit point, may be identified by its pyramidal shape, the tall grass on the southern side of its extremity, and the steep valley southward of it.

Charts 3807, 3808.

About 2½ miles northward of Caurusan point is Tongon point, which has a precipitous bluff, about 200 feet ($61^{m}0$) high on its southern side; the northern side is low. Between Tongon point and Sibono point (*Lat. 13° 27′ N., Long. 123° 08′ E.*), 5 miles north-westward, is Jamuraon (Hamuraon) bay, an open bight with the town of the same name at its head. Sibono point may be identified by its two peaks standing out sharply from the higher ground inland.

Charts 943, 1263.

Charts 3807, 3808.

Anchorage may be obtained by vessels with local knowledge off the town of Jamuraon (Hamuraon), in depths of from 3 to 6 fathoms ($5^{m}5$ to $11^{m}0$), but outside the coastal bank the depths increase rapidly.

Pasacao anchorage.—Pasacao (Pasakao) anchorage lies between Pasacao (Pasakao) point, about 7 miles north-westward of Sibono point, and Refugio island, about 1¼ miles south-eastward. The shore is fringed by a reef, covered with mud and sand, which considerably reduces the anchorage space.

Refugio island, 200 feet ($61^{m}0$) high, is fringed by a steep-to coral reef, extending about three-quarters of a cable from the southern side. The channel between the island and the coast northward of it is deep, but is reduced to a width of about 2 cables by a coral reef extending 2¾ cables from the coast.

The town of Pasacao (Pasakao) is situated on the northern side of the anchorage about three-quarters of a mile northward of Pasacao point. It is connected to the general telegraph system.

Anchorage may be obtained by vessels with local knowledge, in depths of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$), mud, but it is open south-westward. At times a choppy sea sets in, and makes landing on the beach dangerous.

Chart 3807.

Coast.—Between Pasacao point and Bantuin point, about 17 miles north-westward, the coast is steep-to, and the land rises steeply to about 1,000 feet ($304^{m}8$). Tanuan point lies about 4 miles west-north-westward of Pasacao point, and about 4 miles farther north-westward is Buri point, with the town of Dalopaon between them. There is anchorage off the town, but necessarily close in on account of the great depth. About 2¼ miles north-westward of Buri point is Bagulaya point. Tinalmud river enters the gulf close to Wagas point, about 1½ miles north-north-westward of Bagulaya point. About 4 miles south-eastward of Bantuin point and about one mile inland, is a prominent peak, 1,620 feet ($493^{m}8$) high, with a white scar on its side, visible from Arena point (*Lat. 13° 13′ N., Long. 122° 42′ E.*) and from nearly all parts of the gulf northward.

Bantuin point appears as an island from a distance, as the narrow neck of land connecting it with the mainland is low. The point is high, with a peculiarly shaped sharp peak near its end, which is steep-to on its seaward side. Carabang (Karabang) island, 195 feet ($59^{m}4$) high, lies one mile north-westward of the point, and is steep-to. Galvaney island, 240 feet ($73^{m}2$) high, and a rock, 40 feet ($12^{m}2$) high, north-westward of it, lie on the reef extending north-westward from Bantuin point; they are steep-to on the gulf side, but there is foul ground between them and the point.

Anchorage may be obtained by vessels with local knowledge, in a depth of 8 fathoms ($14^{m}6$), north-eastward of Bantuin point, protected by the point and Carabang and Galvaney islands during the South-west monsoon.

Between Bantuin point and Otoc point, 9 miles north-north-westward, is Caima (Kaima) bay. Most of its shore is fringed by coral, and a narrow strip of mangroves extends along the beach. Good anchorage may be obtained by vessels with local knowledge south-westward of Binahian village, situated about 4½ miles north-eastward of Bantuin point, in depths of from 5 to 8 fathoms ($9^{m}1$ to $14^{m}6$), mud. Otoc

Charts 943, 1263.

Chart 3807.

point is the western extremity of Saboon island, which is separated from the mainland by a very narrow channel which dries. Foul ground with a rock awash near the outer end, extends three-quarters of a mile westward from Saboon island (*Lat. 13° 47′ N., Long. 122° 44′ E.*).

Ragay bay is entered between Otoc point and Omon point, about 3 miles north-westward. Omon, Paculalin, Ragay, and Apali rivers discharge into the bay; they are all shallow, being nearly closed by sand bars at low water. Omon point is high and steep-to. Good anchorage may be obtained in the bay by vessels with local knowledge, in depths of from 6 to 10 fathoms ($11^{m}0$ to $18^{m}3$). The town of Ragay, situated at the head of the bay, is connected to the general telegraph system.

Head of Ragay gulf.—Coast.—Catabangan bay is entered between Bagutayoc (Bagutayok) point, about 3 miles north-westward of Omon point, and Kilbay point, 4 miles farther north-westward. The shores are fringed with coral, and there is a 6¾-fathom ($12^{m}3$) patch midway between the two entrance points. Catabangan (Katabangan) river discharges into the head of the bay. Vessels with local knowledge may obtain a well protected anchorage, in depths of from 6 to 8 fathoms ($11^{m}0$ to $14^{m}6$), mud, off the mouth of the river.

Several buoys and a pair of beacons which are privately maintained, mark the entrance to Catabangan river. The beacons, which are situated on the northern bank of the river, consist each of a white diamond-shaped framework structure with a red centre, and in line, bearing 030°, lead through the entrance channel.

There is a wharf at Catabangan (Katabangan), which had, in 1938, a depth of 20 feet ($6^{m}1$) alongside. Water is laid on to the wharf, and there is a travelling crane, with a lifting capacity of 8 tons. There is a pier, which had, in 1938, depths of from 17 to 24 feet ($5^{m}2$ to $7^{m}3$) alongside at Port Ragay, close northward of Bagutayoc point.

Capuluan (Kapuluan) point, 5 miles northward of Lian point (page 383), is low and bordered by mangroves. A prominent rock, which dries except at the highest tides, marks the outer end of a reef which extends 2 cables eastward from Capuluan point. A shoal, with a depth of about one foot ($0^{m}3$) over it, lies one mile eastward of the point, and between it and the point is a shoal, with a depth of 1½ fathoms ($2^{m}7$) over it. The indentations on either side of the point are shallow.

Off-lying danger.—Capuluan (Kapuluan) reef, which dries about 5 feet ($1^{m}5$), lies about 2 miles eastward of Capuluan point. The channel between the reef and the dangers off Capuluan point is one mile wide, deep, and clear of dangers.

Coast.—Between Capuluan point and the town of Guinayangan, 6½ miles north-westward, the coast is fringed with mangroves and the hills rise almost from the water's edge, thence to the mouth of Viñas river the land is low and flat for about a quarter of a mile and then rises abruptly to about 700 feet ($213^{m}4$) in a series of narrow ridges.

Guinayangan is the largest town in Ragay gulf, and is connected to the general telegraph system. A pier extends about 3 cables from the shore. Good anchorage may be obtained by vessels with local knowledge close off the pier, in a depth of 3 fathoms ($5^{m}5$) mud, or in 6 fathoms ($11^{m}0$), about one mile from the town.

Charts 943, 1263.

Chart 3807.

Viñas river has a depth of 9 feet ($2^{m}7$) on its bar, which lies westward of Sibalun islet (*see* below); the channel lies between extensive mud banks which extend from both shores and partially dry. Local knowledge is necessary for entering.

Between Kilbay point (*Lat. 13° 53′ N., Long. 122° 35′ E.*) and Mambulao point, about 3 miles north-westward, the shore bank extends about a quarter of a mile offshore. Kilbay (Kilbait) river flows out on the northern side of the point of the same name. Talcauayan bay, entered between Mambulao point and Awasan point, 1½ miles westward, is for the greater part encumbered with shoals, but good anchorage may be obtained by vessels with local knowledge just inside the entrance, in depths of from 5 to 7 fathoms ($9^{m}1$ to $12^{m}8$), mud.

Sibalun islet is a coral reef overgrown with trees, about 50 feet ($15^{m}2$) high, lying about 1¾ miles west-south-westward of Awasan point, and 6 cables from the head of the gulf. At half-tide the islet is connected to the shore by a narrow sand bar.

Off-lying danger.—Acha reef, over which there is a depth of 2 feet ($0^{m}6$), lies about 1½ miles south-south-eastward of Sibalun islet. The reef is steep-to, but a bank extends over one mile from the shore northward, with a depth of 3 feet ($0^{m}9$) at its outer end. Care should be exercised when navigating in this vicinity, as the water is often muddy and the shoals cannot be distinguished.

Chart 3818.

BURIAS.—The island of Burias, lying in the entrance to Ragay gulf, is generally mountainous and thinly wooded. The coast is steep and generally bordered by coral reefs, with a few stretches of sand beach. The population is small, and the principal products are rice and hemp.

Off-lying islands and dangers.—Templo island, 245 feet ($74^{m}7$) high, lies about 2¾ miles north-westward of Cueva point, the north-western extremity of Burias. There are some detached rocks on the reef which fringes the southern side of the island, and also on the reef which extends half a mile north-eastward from the northern end.

Sombrero, about 1½ miles westward of the south-western extremity of Templo island, consists of two islets close together on a reef. The small islet is 107 feet ($32^{m}6$) high, but the larger one is low and covered with brushwood.

Arena islet, 2¼ miles west-north-westward of Sombrero islets, is fringed by a reef. A spit, with depths of less than 3 fathoms ($5^{m}5$) over it, extends half a mile north-eastward from the islet, and a bank with a depth of 8 fathoms ($14^{m}6$) at its outer end, extends one mile northward.

Inaguaran shoal, with a depth of 19 feet ($5^{m}8$) over it, lies 1¾ miles northward of Arena islet. Between the shoal and the bank extending northward from Arena islet there is a deep channel nearly one mile wide.

Tinalisayan islets lie on a coral reef, about 1¼ miles north-westward of the western extremity of Busin island (page 388), with a channel with a depth of 7 fathoms ($12^{m}8$) in the fairway between them. About 1¼ miles northward of the islets is Tanguingui islet, with a least depth of 15 feet ($4^{m}6$) between. A 21-foot ($6^{m}4$) patch, which is steep-to, lies about three-quarters of a mile northward of Tanguingui islet, with a deep passage between.

Charts 3807, 3808, 943, 1263.

Chart 3818.

A shoal, with a least depth of 9 feet ($2^{m}7$) over it, lies about 2¼ miles northward of Colorada point, the northern extremity of Burias.

Anima Sola islet (*Lat. 13° 13′ N., Long. 123° 03′ E.*), 114 feet ($34^{m}7$) high, lies 4¾ miles north-eastward of Colorada point.

Port Busin.—Port Busin is formed between the north-western end of Burias and Busin island. It is the only typhoon anchorage on the north and west coasts of Burias.

Busin island, 265 feet ($80^{m}8$) high and wooded, is bordered by a coral reef which dries in places. Shallow water extends over half a mile from the north-western side, at the south-western end.

The western entrance to the port is narrow and tortuous ; it lies between partially drying reefs extending from both shores, and is very dangerous for a sailing vessel. The northern entrance is preferable, as though narrow, it is more direct, and its sides are steep-to. This entrance may be identified by Colorada point, which shows yellow patches among the trees that cover it. The coast near the entrance may also be identified by the massive bluffs.

Anchorage.—Directions.—The best anchorage for vessels with local knowledge in Port Busin is off the town of San Pascual, on the eastern side of an inlet on the south-eastern side of the port, and about 2 miles south-south-westward of Colorada point, in a depth of 10 fathoms ($18^{m}3$), mud.

There is a pier one cable long, with a depth of 9 feet ($2^{m}7$) at its head, at San Pascual.

To enter by the northern entrance, a vessel should round Colorada point at a distance of a quarter of a mile and keep in mid-channel between Burias and Busin island to the anchorage.

If entering by the western entrance a large white cliff on the western end of Busin island is a good mark when approaching. This cliff, bearing 070°, leads clear of the reef which extends from the western side of the entrance.

Radio station.—There is a radio station at San Pascual. (*See* page 14).

Western side of Burias.—Dangers.—The western coast of Burias is fringed by an irregular coral reef. A shoal, with a depth of 16 feet ($4^{m}9$) over it, lies half a mile south-westward of Cueva point. About 1½ miles south-eastward of Cueva point is the entrance to Alimango bay, in which an indifferent anchorage may be obtained by vessels with local knowledge. A shoal, with a depth of 7 feet ($2^{m}1$) over it, and a rock, awash, lie in the entrance to the bay.

About 5½ miles southward of Cueva point is Guinduganan point, with the bay of the same name close eastward of it. Between Guinduganan point and Aguja point, the south-eastern extremity of the island, the coast is steep, and fringed by coral reefs interspersed with sand and gravel beaches.

Ilog bay is a small bight on the eastern side of Mangrove point, situated 6½ miles east-south-eastward of Guinduganan point. About 12½ miles south-eastward of Mangrove point is Malapingal point, close eastward of which is Nabasagan village, situated at the head of a small bay of the same name. About 1½ miles east-north-eastward of Nabasagan is Mount Engañoso, 1,403 feet ($427^{m}6$) high, and the highest point on Burias ; it is the only good landmark at night along this coast.

Charts 3807, 943, 2661b, 1263.

Chart 3818.

A rock, awash, with several other shoals, with depths of from one to 3 fathoms (1^m8 to 5^m5) over them within half a mile northward and south-westward of it, lies about one mile offshore and 1½ miles north-westward of Malapingal point. There is a channel, with a depth of 7 fathoms (12^m8), between these shoals and the coast. Vessels should keep well offshore when navigating in this vicinity.

Gorrion islet (*Lat. 12° 49′ N., Long. 123° 16′ E.*) lies on the edge of the coastal reef, which extends a quarter of a mile offshore, about 4¼ miles south-eastward of Malapingal point. The coastal reef extends for about 4 miles south-eastward of the islet and over half a mile offshore in places, and a bank, with depths of less than 5 fathoms (9^m1) over it, extends about one mile offshore. Thence to Aguja point the coast is steep and clear of danger.

Aguja point is bold and free from danger; the land slopes gradually from Mount Sagurun, 725 feet (221^m0) high, 3 miles north-westward.

Caution.—When approaching Burias island from westward in thick weather, such as occurs in the South-west monsoon, the southern part of the island, which is comparatively low, may be hidden, and the slope of Mount Egañoso may be mistaken for the end of the island.

Eastern side of Burias.—Between Colorada point and the entrance to Port Busainga, about 3½ miles south-eastward, is Laorente bay, which is open and fringed by reefs, one of which is awash, and shoals, which extend three-quarters of a mile offshore in the eastern part.

Port Busainga.—Anchorage.—Port Busainga, entered between Piedras point and Boca point, about 1¾ cables southward, is an excellent typhoon anchorage for small vessels with local knowledge. The channel leading into the inner anchorage is about half a cable wide at its narrowest part, and vessels with a draught of 12 feet (3^m7) can safely use it.

Boca islets lie on the outer edge of the coral reef which extends about 3½ cables from the coast northward of Piedras point. The northern and larger islet is 56 feet (17^m1) high and wooded, while the smaller one is 45 feet (13^m7) high and covered with tall grass.

A rocky reef, which dries, extends nearly three-quarters of a cable northward from Medio point, which lies on the south-eastern side of the port about half a mile south-westward of Boca point, the southern entrance point. All the bights on either side of the entrance channel are filled with reefs which dry. The head of the port is mostly shallow.

Vessels with local knowledge may obtain anchorage in Port Busainga, in a depth of 12 fathoms (21^m9), mud, about midway between Estero point, situated about 3½ cables south-south-westward of Boca point, and the point on the opposite shore about 1½ cables north-westward of it.

Coast.—About 6¼ miles south-south-eastward of the southern entrance point of Port Busainga is Casameyon (Kasameyon) point, with Dampalan bay, which is encumbered with reefs, immediately westward of it. The bay can be easily identified by the junction of the wooded hills northward of Bagabarco (Bagabarko) point, situated about 2 miles north-westward of Casameyon point, and the lower hills covered with grass, southward. South-eastward of Casameyon point the coastal reef widens and extends about half a mile offshore.

At San Pinetan point, about 5 miles south-south-eastward of Casameyon point, a reef, part of which dries, extends about 2 miles south-eastward, and at Siargao point, 5¾ miles farther south-eastward, a coral

Charts 3807, 3808, 943, 1263.

Chart 3818.

reef, which dries, extends 2 miles north-westward. Between these two reefs is the entrance to Nonoc (Nonok) bay, in which there is an area affording anchorage, in depths of from 13 to 14 fathoms ($23^{m}8$ to $25^{m}6$), mud, to vessels with local knowledge. The broad coral reef fringing the shore of Nonoc bay continues around Siargao point and as far as Madanlog point, about 3 miles south-eastward. Thence to Aguja point the coast is steep, with a narrow coral fringing reef and sand beach.

Port Boca Engaño.—Port Boca Engaño, entered on the western side of Tres Marias point (*Lat. 12° 47′ N., Long. 123° 19′ E.*), situated 5½ miles south-south-eastward of Madanlog point, is not recommended as an anchorage. The depths are considerable, the bottom is hard, and there is little swinging room.

There is an extensive coral shoal, part of which dries, in the middle of the entrance, and the head of the inlet is filled by a reef covered with mud. The land around the inlet is low, and thus affords no protection from the wind during a typhoon.

Anchorage.—Directions.—Anchorage may be obtained by small vessels southward of the extensive shoal in the middle of the entrance, with Tres Marias point bearing 038°, in a depth of 16 fathoms ($29^{m}3$).

A vessel should approach the anchorage with the bold bluff of Castillo point, situated on the western side of the entrance about one mile west-north-westward of Tres Marias point, bearing 235°, until within about 1½ cables from it, when she should alter course southward and steer parallel with the western shore of the port at a distance of about one cable, and anchor as recommended above.

Burias pass.—Burias pass is the name given to the channel between the eastern side of Burias and Luzon.

SOUTHERN SIDE OF LUZON.—Coast.—Light.—Dangers.—Solitario islet (*Lat. 13° 01′ N., Long. 123° 21′ E.*), 34 feet ($10^{m}4$) high, lies about 2 miles eastward of Cabarian point (page 383) and half a mile off the coast, to which it is joined by a shallow reef. Vessels should keep well southward of the islet to avoid the bank extending from this coast.

Eastward of Solitario islet the coast forms Panganiran bay, open southward. Bagalayog point, 2½ miles north-eastward of the islet, is prominent and affords some protection to a vessel anchoring eastward or westward of it. Several small villages are scattered along this coast, of which Magradongdong, about 1½ miles eastward of Bagalayog point, is the largest.

Catundulan (Katundulan) point, 10 miles south-eastward of Bagalayog point, consists of sand cliffs, from about 60 to 110 feet ($18^{m}3$ to $33^{m}5$) high; it is wooded except for one patch of tall grass near the cliff on the south-western side. Sunken coral heads and a reef, which dries, extend nearly 1¼ cables from the point.

Tinanogan bay, eastward of Catundulan point, has a flat sandy beach, which dries for a considerable distance offshore. Pampang point, the eastern entrance point of the bay, is composed of light-coloured cliffs, about 40 feet ($12^{m}2$) high, but is not prominent.

Donsol is a town situated on the eastern side of the mouth of the river of the same name, about 1¾ miles south-eastward of Pampang point. In the town all the buildings except one with a galvanised iron

Charts 3807, 3808, 943, 1263.

Chart 3818.

roof had been destroyed. The mouth of the river is fronted by sand banks and fish traps which extend half a mile offshore. On the bar there is a depth of about 2 feet ($0^{m}6$), but increases inside to 6 feet ($1^{m}8$) and more. Small boats usually land on the sandy beach just northward of the light-structure.

A rock, awash, lies on the bank in the approach to Donsol river, about a quarter of a mile south-westward of the light-structure.

A light is exhibited, at an elevation of 37 feet ($11^{m}3$), from a concrete tower, on the eastern side of the entrance to Donsol river. It was reported, in 1949, that the light-tower could not be distinguished, as it was obscured by a nipa house and a coconut tree.

Between Donsol (*Lat. 12° 54′ N., Long. 123° 35′ E.*) and Dumaquit (Dumakit) point, about 4 miles south-eastward, the coast is low with a continuous sandy beach. About 1½ miles eastward of Donsol the Ogod river discharges; it is shallow at its mouth, but increases to a depth of 7 feet ($2^{m}1$) above the bridge, about one mile from the entrance. Dumaquit point is covered with tall grass and small trees, and terminates with vertical cliffs, about 30 feet ($9^{m}1$) high.

A shoal, with a depth of 4 fathoms ($7^{m}3$) over it, lies one mile south-south-westward of Dumaquit point.

Port Putiao.—Port Putiao is entered between Dumaquit point and Cutcut (Kutkut) point, about 2½ miles eastward; the northern part is known as Pilar bay. A reef, which dries, extends about 4 cables south-eastward from Dumaquit point. The shores of the port are foul, and the entire inlet is shallow, but there is a narrow channel, with a depth of 8 feet ($2^{m}4$), which leads to the anchorage off the town of Pilar at the head of the port. Malbug river, which discharges into the north-eastern part of Pilar bay, is an important means of communication, and with its branches, flows through a prosperous agricultural country.

Anchorage may be obtained by small vessels with local knowledge with the church at Pilar bearing 030°, and Punahuan islet, close south-westward of San Antonio, situated about 6 cables south-eastward of Pilar, bearing 080°.

Port Panlatuan.—Port Panlatuan, entered between Cutcut point and Bantigui point, 2¾ miles south-eastward, is much encumbered with shoals and reefs. Mecapiot (Mekapiot) bay, the north-western arm of the port, is an excellent typhoon anchorage for vessels with a draught not exceeding 12 feet ($3^{m}7$). Two rocks awash lie at the outer end of a bank extending about 6 cables southward from Cutcut point, and a reef, which dries, extends about 1¼ miles westward from the eastern shore just inside the entrance. Bantigui point is low, rocky, and wooded, and terminates in clay cliffs and a gravel beach; it is fringed by a reef which extends about 2 cables southward. The town of Panlatuan stands on the point of the same name on the western side of the port about one mile north-eastward of Cutcut point.

Anchorage may be obtained by small vessels with local knowledge, in a depth of 2 fathoms ($3^{m}7$), mud, about 2¾ cables north-westward of Panlatuan point.

Sorsogon bay.—Sorsogon bay is the largest and best harbour in southern Luzon, and is a good typhoon refuge. The entrance is divided into three channels by Malaumauan and Bagatao islands. The channel between these two islands is the only practicable one for ordinary vessels; the others, between the islands and the coast of

Charts 3808, 943, 1263.

Luzon are narrow and encumbered with shoals. There are several towns on the shores of the bay, of which Sorsogon (*Lat. 12° 58′ N., Long. 124° 00′ E.*), the capital of Sorsogon province, Casiguran (Kasiguran), and Castilla are the most important.

Entrance. — Lights. — Dangers. — Buoy. — The main entrance is about 1½ miles wide between Malaumauan island on the west, and Bagatao island on the east, but the navigable channel, which is deep, is reduced to about three-quarters of a mile between the 5-fathom (9ᵐ1) lines on either side. The seaward sides of the islets on the northern side of the channel within Malaumauan island are steep-to.

Malaumauan island, lying about 1⅛ miles eastward of Bantigui point, is low, flat, wooded, and bordered by white sandy beaches. A narrow spit extends about 8 cables northward from the northern extremity of the island, leaving only a narrow channel between it and the coast of Luzon. A rocky bank, which dries in places, extends 1¼ miles south-westward from the island, and is marked on its south-eastern edge by a black can buoy.

Bagatao island is 415 feet (126ᵐ5) high, and wooded. The coasts of the island are clear of dangers except on the south-eastern side. A shoal, with a depth of 3 fathoms (5ᵐ5) over it, lies about half a mile south-south-eastward of the western extremity of the island. Tinacos islet, 40 feet (12ᵐ2) high, lies a quarter of a mile northward of the north-eastern extremity of the island.

A light is exhibited, at an elevation of 135 feet (41ᵐ1), from a white circular iron tower and dwelling, on the southern point of the western extremity of Bagatao island. *See* view facing page 39.

A light is exhibited, at an elevation of 43 feet (13ᵐ1), from a white concrete column, on the northern point of the western extremity of Bagatao island.

Abreast the eastern end of Bagatao island, between it and the mainland, is the small port of Magallanes. A narrow deep channel leads to it from northward, but there is only a depth of 8 feet (2ᵐ4) on the bar in the southern approach.

A group of islets and dangers lie on the north-western side of the fairway; Maririgi islet, 75 feet (22ᵐ9) high, the southernmost of the group, lies about 2 miles northward of Tinacos islet; about 3 cables farther northward is Lavampa, 115 feet (35ᵐ0) high, 3 cables northward of which is Matagdac, 190 feet (57ᵐ9) high. A shoal with a depth of 2 fathoms (3ᵐ7) over it, lies about 6 cables south-westward of Tomalaytay islet, which is situated about one mile west-south-westward of Maririgi islet.

Magallanes rock, awash, lies about 1½ cables northward of Macuhil (Makuhil) point, situated on the southern side of the channel, 3¼ miles north-eastward of Magallanes.

Caution.—There are numerous fish traps and stakes in Sorsogon bay.

Anchorages.—Directions.—Vessels may obtain temporary anchorage over a bank of fine, black sand which extends about 3 miles south-westward from Bagatao island, in depths of from 10 to 16 fathoms (18ᵐ3 to 29ᵐ3). Good sheltered anchorage may be obtained northward of Bagatao island, off a small sandy beach close westward of Tinacos islet.

Small vessels may obtain a good typhoon anchorage south-westward

Chart 3818.

of Sablayan island, situated 1½ miles eastward of Macuhil point; they should approach the anchorage with Palinahuan point, situated about 1¼ miles northward of Macuhil point, bearing 316° astern, and anchor south-westward of the sandy point. This channel carries a depth of about 9 feet ($2^{m}7$).

Anchorage may be obtained anywhere in Sorsogon bay according to draught.

A vessel bound for Sorsogon should pass about one mile eastward of the black can buoy on the western side of the entrance to Sorsogon bay, steering 017°, until Bagatao island lighthouse bears about 112°, when she should steer for Macuhil point, bearing 064°, until Lavampa islet bears about 338°; then she should steer 038° until Macuhil point (*Lat. 12° 53′ N., Long. 123° 51′ E.*) bears about 168°, when she should steer 066°, which will lead to the anchorage off Sorsogon.

Submarine cable.—A white triangular beacon, situated on the drying bank southward of Sorsogon, in line with a similar beacon on the cable hut on the shore north-eastward, indicates the line of a submarine cable, which is marked by a pecked line on the chart. Vessels are cautioned not to anchor in its vicinity.

A telegraph buoy is moored on the northern side of Sorsogon bay, well out of the track of navigation.

Sorsogon.—At Sorsogon there are two piers which dry. The church tower is prominent.

The town is connected to the general telegraph system.

Storm signals.—Storm signals are shown at Sorsogon. *See* page 11.

Lights.—A light is exhibited, at an elevation of 49 feet ($14^{m}9$), from a white concrete tower, at Castilla, situated on the northern side of the entrance to Dalagnan river, at the north-western end of Sorsogon bay.

A light is exhibited, at an elevation of 65 feet ($19^{m}8$), from a white concrete tower, at Casiguran, situated on the southern side of Sorsogon bay, near the head.

Coast.—**Light.**—Between Magallanes and Sabang point, about 11 miles southward, the coast is mostly a sandy beach shelving gradually into deep water, and is intersected by numerous creeks that may be entered by small boats at high water. The land rises gradually inland to the foot of Mount Bintacan (Bintakan) and Mount Culangalan (Kulangalan), situated about 6½ miles east-south-eastward, and 8¾ miles south-south-eastward, respectively, of Magallanes; it is intersected by numerous ravines and has the appearance of rolling country partly cultivated, and partly wooded.

Chart 3370.

Bulan, the most important town on this part of the coast, is situated on the northern side of the entrance to Sabang river, close northward of Sabang point. Hemp and copra are the principal exports. There is frequent steamer communication with Manila and other coastal ports.

A light is exhibited, at an elevation of 32 feet ($9^{m}8$), from a white concrete beacon, at Bulan. In 1949, it was reported that the light-beacon was difficult to distinguish.

Anchorage may be obtained, in depths of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$), with the light-structure or the church bearing 075°.

There is a concrete pier at Bulan.

Charts 3808, 943, 1263.

Chart 3370.

Coast.—Verde hill, 480 feet (146^{m}3) high, and covered with tall grass, lies 3½ miles eastward of the light at Bulan; it shows up well against the dark wooded hills farther inland.

Agnas point, about 3¼ miles south-eastward of Sabang point, is a well defined flat-topped bluff, 120 feet (36^{m}6) high, covered with tall grass, and with almost vertical sides which are nearly bare; trees extend to within a short distance of the bluff. Temporary anchorage may be obtained in Otabi bay, off this coast.

Butag bay, entered eastward of Agnas point (*Lat. 12° 37′ N., Long. 123° 55′ E.*), is about three-quarters of a mile wide. The shores are wooded, and the head of the bay is shoal. Anchorage may be obtained in the bay, in depths of from 7 to 10 fathoms (12^{m}8 to 18^{m}3), mud, in the middle of the bay. Butag village is situated at the head of the bay. About 1¾ miles south-eastward of Agnas point is Bunubog point, on the northern side of which is Biton bay, and on the eastern side Marinab bay.

About 3¼ miles south-south-eastward of Bunubog point is Tagiran point, which is the termination of a flat-topped peninsula, 30 feet (9^{m}1) high, and covered with tall grass. This part of Luzon is mountainous and densely wooded. The summits of the main ridge are from about 1,000 to 1,940 feet (335^{m}3 to 591^{m}3) high. Mount Calomutan (Kalomutan), 1,940 feet (591^{m}3) high, and Mount Sujac (Sujak), 1,645 feet (501^{m}4) high, situated about 2 miles north-north-eastward and 2½ miles north-eastward, respectively, of Tagiran point, are prominent.

Chart 3818.

TICAO.—Light.—The island of Ticao (Tikao), separated from Luzon by Ticao (Tikao) pass, is mountainous and thinly populated.

Bagababoy (Bagababoi) island, 318 feet (96^{m}9) high, wooded, and steep-to, lies close north-westward of Nunun point, the northern extremity of Ticao, being separated by Marcos pass, which is deep and clear of dangers. On the western side of the island are some high vertical cliffs.

San Miguel island, 263 feet (80^{m}2) high, lies about a quarter of a mile north-westward of Bagababoy island; it is nearly divided, the two parts being connected by a low sand spit. Between the two islands is an islet, 162 feet (49^{m}4) high. The tidal streams in the vicinity of these islands are very strong.

A light is exhibited, at an elevation of 222 feet (67^{m}7), from a concrete tower, on the north-western end of San Miguel island.

A shoal, with a least depth of 4 fathoms (7^{m}3) over it, lies 4¼ cables east-north-eastward of the northern extremity of Bagababoy island, and a 7-fathom (12^{m}8) patch lies 3 cables north-westward of San Miguel island light tower. A spit, with depths of from 5 to 7 fathoms (9^{m}1 to 12^{m}8) over it, extends about 1¼ miles northward from Nunun point.

Charts 3370, 3818.

Eastern side of Ticao.—Coast.—Off-lying bank.—The eastern coast of Ticao is indented by several bays, in four of which good anchorage may be obtained, as well as on the bank which extends one mile eastward from the southern end of the island.

Taclogan (Taklogan) bay, entered about 7 miles south-eastward of

Charts 3808, 943, 1263.

Charts 3370, 3818.

Nunun point, is open north-eastward, but is protected from the sea by the reefs. A reef, with a depth of 3 feet ($0^{m}9$) over it, lies in the middle of the entrance; between it and the reef extending from the western entrance point there is a channel one cable wide with a depth of 22 feet ($6^{m}7$), and southward of it, there is a deep channel, clear of dangers. A bank, with a depth of 7 feet ($2^{m}1$) over it, extends 2 cables from the southern shore about half a mile westward of Tasiran point, the southern entrance point; a reef and a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends about a quarter of a mile northward from Tasiran point (*Lat. 12° 37′ N., Long. 123° 43′ E.*).

Anchorage may be obtained by small vessels with local knowledge, in depths of from 10 to 12 fathoms ($18^{m}3$ to $21^{m}9$), mud, northward of Rizal village, about 9 cables west-south-westward of Tasiran point. There is not much swinging room, but the holding ground is good. A narrow channel leads into a basin in a shallow lagoon which affords a landlocked anchorage for small craft.

An 8-fathom ($14^{m}6$) patch lies about 3¼ miles north-eastward of Tasiran point.

Chart 962, plan of Port San Jacinto.

Port San Jacinto.—Light.—Port San Jacinto, entered between San Antonio point, situated about 2 miles southward of Tasiran point, and San José point, 5½ cables farther, affords good anchorage, well protected except from eastward, with ample swinging room.

The town of San Jacinto, situated on the southern shore at the entrance, is the most important town on the island. It may be identified by several prominent hills, from 200 to 400 feet ($61^{m}0$ to $121^{m}9$) high, and covered with tall grass, behind the town.

A light is exhibited, at an elevation of 55 feet ($16^{m}8$), from a white concrete tower, on San José point.

Anchorage may be obtained northward of the town, about 1½ cables offshore, or in the middle of the port, in depths of from 7 to 10 fathoms ($12^{m}8$ to $18^{m}3$), with San Cosme point, situated on the northern shore 3 cables south-westward of San Antonio point, bearing about 000°. Vessels should approach this anchorage steering 262°.

The head of the bay is shallow, and mud flats which dry, with reefs at the outer end, extend a considerable distance offshore.

Chart 3370.

Coast.—About 5 miles south-south-eastward of San José point is Lagan point, immediately southward of which is Ticao (Tikao) bay. The town of San Fernando stands at the head of the bay, and close northward of it is a lagoon, which boats can enter at high water. Anchorage may be obtained, in depths of from 6 to 12 fathoms ($11^{m}0$ to $21^{m}9$), with the town bearing 258°, on which bearing the vessel should approach.

Batuan bay, entered southward of Aricomo (Arikomo) point, about 3½ miles southward of Ticao bay, affords a partially protected anchorage for small vessels. A reef extends 2¾ cables eastward from the northern entrance point, on which stands the town of Batuan. A reef also extends about a quarter of a mile north-eastward from the southern entrance point; the edge of this reef is usually marked by stakes. A vessel entering should keep from a quarter to half a cable northward of these stakes, and anchor in depths of from 3 to 4 fathoms ($5^{m}5$ to $7^{m}3$), mud, southward of the town. If the stakes are not in place, she

Chart 3370.

should steer for a small conical hill on the southern shore, bearing 225° and alter course to 270° when a depth of 5 fathoms ($9^{m}1$) is obtained.

Biton bay, entered about 1¾ miles southward of Batuan bay, is encumbered with shoals. A bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends over one mile eastward from the coast between Biton bay and San Rafael point, the southern extremity of Ticao. A 16-foot ($4^{m}9$) patch lies about 1¼ miles north-eastward of San Rafael point (*Lat. 12° 20′ N., Long. 123° 47′ E.*) and 6 cables offshore.

Island and dangers off the southern end of Ticao.—Matabao island, 174 feet ($53^{m}0$) high, is separated from San Rafael point by a narrow channel, with a least depth of 11 fathoms ($20^{m}1$) between the banks extending eastward from the point and north-eastward from Matabao island. The tidal stream does not set fairly through this channel, which should be avoided. The southern and western sides of the island are steep-to and may be passed at a distance of a quarter of a mile. A bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends 1½ miles north-eastward from the north-eastern side of Matabao island.

A light is exhibited, at an elevation of 106 feet ($32^{m}3$), from a white circular tower, on Argos point, the southern extremity of Matabao island.

Black Rock pass, between Argos point and Magcaragit (Magkaragit) island, about 2¾ miles south-south-eastward, is divided into two channels by Black rock, which dries 5 feet ($1^{m}5$), but is difficult to distinguish. Both channels are deep in the fairway, but the irregular depths and strong tidal streams cause heavy tide-rips and whirlpools.

Magcaragit island is 275 feet ($83^{m}8$) high at its southern extremity. A bank, with a depth of 15 feet ($4^{m}6$) at its outer end, extends about 4 cables eastward from the island, and a bank, with depths of less than 6 fathoms ($11^{m}0$) over it, extends 1¼ miles north-eastward and eastward, and half a mile northward from it. A bank, with a depth of 34 feet ($10^{m}4$) over it, lies about one mile north-north-eastward of the island.

Deagan island, 110 feet ($33^{m}5$) high, lies about 6½ cables south-eastward of Magcaragit island. It is fringed by a narrow reef, and a bank, with depths of less than 5 fathoms ($11^{m}0$) over it, extends 1¼ miles eastward from Ponduhan point, the eastern extremity. Close off the north-western end of the island are Dakit and Hamoraon islets.

The passage between Deagan island and Cadulan (Kadulan) point, about three-quarters of a mile south-eastward, has a least depth of 8 fathoms ($14^{m}6$) in the fairway, but there are shoals on either side which contract the channel to a width of about a quarter of a mile with depths of over 5 fathoms ($9^{m}1$).

Directions.—A vessel bound eastward passing between Matabao island and Black rock should bring the light tower on Argos point to bear 070° and not more than one mile distant, then steer to make good 090°, allowing for the tidal stream which has a strong tendency to set on to Black rock during the east-going stream; when Dakit islet, which is prominent, bears 180°, course may be altered as requisite. A vessel bound westward through the same channel should steer for Argos point light tower, bearing 280°, until Dakit islet bears 180°, when she should steer to make good 270° until the light-tower is on the quarter, when course may be altered as requisite.

Charts 3808, 943, 1263.

Chart 3370.

A vessel passing between Black rock and Magcaragit island should keep in mid-channel and pass about three-quarters of a mile northward of Magcaragit island, continuing until the middle of the cliff of Deagan island bears 180° if bound eastward; if bound westward she should keep in mid-channel until the light-tower on Argos point bears 000°.

A vessel bound eastward through the channel between Deagan island (*Lat. 12° 15′ N., Long. 123° 51′ E.*) and Cadulan point, should give the southern point of Deagan island a berth of about a quarter of a mile, and then steer about 068° for about 2 miles, when she may alter course as requisite. If bound westward, she should steer 248° through the middle of the passage and pass about a quarter of a mile southward of Deagan island.

Tidal streams.—In the eastern approach to Black Rock pass cross-channel streams cause dangerous tide-rips. The tidal streams run at a considerable rate, attaining a rate through Black Rock channels, of from 3 to 5 knots at springs, with violent eddies. The streams are reported to be weaker in the channel between Cadulan point and Deagan island.

Chart 3818.

Western side of Ticao.—Coast.—The west coast of Ticao is steep and rugged, and has no good anchorage, except for small craft.

Port San Miguel.—Port San Miguel, entered between Tabunan point, situated 1½ miles south-westward of Nunun point, and North-west point, about 2¼ miles farther, is open north-westward, but an excellent typhoon anchorage may be obtained by vessels with local knowledge off Pandan village, in the south-eastern arm of the port, where the reefs give protection from the seas.

Faltaban island, 219 feet ($66^{m}7$) high, lies about 2½ cables westward of Tabunan point; it has a vertical cliff on its north-western side. Yeso island, 189 feet ($57^{m}6$) high, and covered with brushwood, lies about 5½ cables southward of the same point and close off the eastern shore of the port, to which it is connected by a reef. Catpatin (Katpatin) island, 270 feet ($82^{m}3$) high, and densely wooded, lies about 1½ cables northward of North-west point. The western side has bold, vertical cliffs, about 150 feet ($45^{m}7$) high.

Pilar bay, the south-western arm of the port, is fronted by the Puro islets and much foul ground, but a narrow channel leads into the bay south-eastward of the reef on which the islets lie. The shores of the bay are fringed with mangroves. Mount Pandan, 765 feet ($233^{m}2$) high, and oval shaped, lies on the western side of Pilar bay, about one mile southward of North-west point.

The south-eastern arm of Port San Miguel has a least width of about one cable and is fringed by reefs which are steep-to and at the entrance can be easily distinguished. The channel abreast Pandan village is less than half a cable wide. Small craft with local knowledge may obtain anchorage in mid-channel south-eastward of Pandan, in a depth of 6 fathoms ($11^{m}0$), mud. Hawsers can be secured to the shore on both sides. The reefs at the head of the bay are difficult to distinguish on account of the muddy water, and vessels should not go above the recommended anchorage.

Coast.—Togoron bay, entered about 3½ miles south-south-eastward

Charts 3808, 943, 1263.

Chart 3818.

of North-west point (*Lat. 12° 39′ N., Long. 123° 35′ E.*), is open southward, has very little swinging room, and is not recommended as an anchorage. A shoal, with a depth of 28 feet ($8^{m}5$) over it, lies about 2 cables southward of the western entrance point.

Buho islet, 108 feet ($32^{m}9$) high, lies about 1¼ miles southward of the entrance to Togoron bay; it is separated from the coast of Ticao by a channel, with a depth of 15 feet ($4^{m}6$). Talisay (Talisai) bay, about 7 miles south-eastward of Buho islet, has a bank, with a depth of 16 feet ($4^{m}9$) over it, extending about a quarter of a mile from its head. Tatus islet, 80 feet ($24^{m}4$) high, lies half a mile westward of San Rafael point, and is separated from it by a channel, with a depth of 11 fathoms ($20^{m}1$).

NORTH-EASTERN SIDE OF MASBATE.—Coast.—Bugui point (*Lat. 12° 36′ N., Long. 123° 14′ E.*), the northern extremity of the island, and the lighthouse have been described on page 345. From Bugui point to Colorada point, 9 miles east-south-eastward, the coast is steep-to, and there are no off-lying dangers. The coastal reef extends from half a cable to 2¼ cables offshore. Diablo islet lies on the coastal reef about 4 miles east-south-eastward of Bugui point.

Port Barrera. — Light. — Dangers. — Buoys. — Port Barrera, entered between Colorada point and Catbatan (Katbatan) point, about 2 miles south-eastward, affords a well protected anchorage with good holding ground. The surrounding land is mountainous, and of a reddish colour. The shores are fringed with mangroves.

Mount Canatonatoan (Kanatonatoan), 735 feet ($223^{m}1$) high, and Mount Bagadila, 1,055 feet ($320^{m}6$) high, situated about one mile and 1¾ miles, respectively, southward of Aroroy (Aroroi), on the south-eastern shore, are useful marks when approaching the port. They are conical in shape, whereas the higher mountains inland are of irregular shape.

Colorada point is the termination of a succession of small hills from about 200 to 300 feet ($61^{m}0$ to $91^{m}4$) high, ending in a bluff, about 50 feet ($15^{m}2$) high. A coral reef, which dries, extends about one cable north-eastward from the point, and a bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends 3¾ cables eastward.

A light is exhibited, at an elevation of 103 feet ($31^{m}4$), from a white concrete tower and dwelling, on Colorada point.

Catbatan point is hilly and wooded; from it a coral reef extends 2¼ cables northward, with Catbatan rock, which is prominent, near the outer end. The southern shore of the outer part of the port is irregularly fringed by a reef which dries in places, extending about 3 cables off, broken only off the town of Aroroy, where a black can buoy marks its eastern edge. A reef, which dries, extends about 4 cables north-eastward from Matalan point, situated about 2 miles south-westward of Colorada point, and from about 1¼ to 4 cables from the shore of the bay north-westward of it.

A coral reef, with a depth of 3 feet ($0^{m}9$) over it, lies 6½ cables eastward of Matalan point, and is marked on its southern side by a red conical buoy. Another reef, with a depth of one fathom ($1^{m}8$) over it, lies 3¼ cables westward of Amoron point, situated 2¼ miles south-westward of Catbatan point. It is marked on its western side by a black can buoy. The eastern side of the channel westward of Macatul

Charts 3808, 943, 1263.

Chart 3818.

(Makatul) point, situated about 1¼ miles southward of Amoron point, is marked by a black can buoy.

The head of the port is shallow. Lanan river discharges into the southern side of the port near the head, but the approach is encumbered with mud flats. Small boats may land in Guinobatan river, which flows into the port about three-quarters of a mile southward of Amoron point. Lanan and other rivers which discharge into the head of the port cause a strong northerly current during the out-going stream, in the inner anchorage, with practically no current during the in-going stream.

Anchorages.—Good anchorage may be obtained, in a depth of 22 fathoms ($40^{m}2$), coarse sand and mud, southward of the sandy beach at Colorada point (*Lat. 12° 33′ N., Long. 123° 23′ E.*), also in the entrance to Port Barrera, with Colorada point bearing 000°.

The best protected anchorage is in mid-channel westward of the mouth of Guinobatan river or north-westward of Magaguilan islet, which lies about 1½ cables south-westward of Macatul point.

Aroroy.—Aroroy, about three-quarters of a mile south-westward of Catbatan point, is the only town of importance in Port Barrera; all the houses have nipa roofs. There is steamer communication with other ports. There is a wooden pier, with a depth of 11 feet ($3^{m}4$) at its head, at Aroroy.

Coast.—Pasil bay, entered 9 miles south-eastward of Catbatan point, is a small inlet open northward. The town of Magdalena, in which there is a church, is situated on the eastern side of the bay. Good anchorage may be obtained by vessels with local knowledge, in depths of from 7 to 8 fathoms ($12^{m}8$ to $14^{m}6$), mud, in mid-channel between a well defined sand spit on the western side and the church in Magdalena. Good protection may be obtained nearer the head of the bay, in a depth of about 3 fathoms ($5^{m}5$).

Bagubaut point, close eastward of Pasil bay, is a prominent bold headland; thence to the entrance to Masbate harbour, about 6 miles south-south-eastward, the coast is steep-to and there are no off-lying dangers.

Chart 962, plan of Masbate harbour.

Masbate harbour. — Light. — Buoys. — Masbate harbour is entered on the south-eastern side of North-west point. It is easy of access if the buoys are in position, and is deep and well sheltered from all winds. Reefs, which are steep-to, extend from both sides of the entrance, leaving a navigable channel about 1¾ cables wide. The north-eastern edge of the reef which extends from North-west point is marked by a red conical buoy, and the western edge of the reef extending from the eastern side of the harbour is marked by a black can buoy. These buoys were reported missing in 1950.

A reef, which partly dries and is steep-to, extends southward and eastward from the northern side of the harbour. The head of the harbour is shallow. Several rivers discharge into the harbour through the mangrove swamps which border the shores.

A light is exhibited, at an elevation of 52 feet ($15^{m}8$), from a white framework structure on a concrete house, on the western side of the entrance to Masbate harbour.

Anchorage.—Directions.—Anchorage may be obtained about 1½ cables from the pier at Masbate, in depths of from 16 to 17 fathoms ($29^{m}3$ to $31^{m}1$), mud.

Charts 3808, 3823, 943, 1263.

Chart 962, plan of Masbate harbour.

A vessel approaching the entrance should steer for the light-structure bearing 226°, and when one mile from it should steer for Bagalejo (Bagaleho) point, which can easily be identified, on the southern side of the harbour, about 11 cables south-south-westward of the light-structure, bearing 207°, and when clear of the entrance course may be altered for the anchorage.

Masbate.—The town of Masbate stands on a bluff on the eastern side of the harbour. There is a T-shaped pier, 234 feet (71^{m}3) long at the face, at the northern end of the town with a depth of 28 feet (8^{m}5) alongside, and a school, at the eastern end of the town, has a galvanised iron roof which is prominent from all directions.

Masbate is connected to the general telegraph system.

Storm signals.—Storm signals are shown at Masbate. *See* page 11.

Chart 3818.

Coast.—Mobo bay, close south-eastward of Masbate harbour, is entered between Baybay point (*Lat. 12° 22′ N., Long. 123° 38′ E.*), about 1¾ miles eastward of North-west point, and Sagausauan point, about 2¼ miles south-eastward. It is foul and of little importance to navigation. Buntud reef lies in the middle of the entrance to the bay, and with the reefs extending a quarter of a mile off Baybay point is a danger to vessels approaching Masbate harbour from south-eastward.

Tacu and Mobo shoals, with depths of 3 and 4½ feet (0^{m}9 and 1^{m}4) over them, respectively, lie about 3½ cables north-north-westward and half a mile westward of Sagausauan point. The anchorage is inside these shoals off the town of Mobo.

The south-eastern part of the bay is filled by a shallow bank, through which Mobo river discharges. On the western side of the river, at the mouth, stands the town of Mobo, which is of little importance. The land in the vicinity is hilly, and very fertile.

Gorda point, about 2 miles south-eastward of Sagausauan point, is composed of large rocks, from which the wooded land rises steeply to an elevation of about 450 feet (137^{m}2), and is prominent from northward and southward.

Chart 3370.

Uson bay is entered between Paniqui (Paniki) point, about 6 miles south-south-eastward of Gorda point, and Tabunan point, about 2¾ miles eastward of Paniqui point. The head of the bay is filled with sand and mud, and the shore is bordered with mangroves. Uson village is situated on the eastern shore of the bay. A bank, with depths of less than 3 fathoms (5^{m}5) over it, and 10 feet (3^{m}0) at its outer end, extends about three-quarters of a mile westward from Tabunan point, and a 28-foot (8^{m}5) patch lies about a quarter of a mile south-westward of the outer end of the bank.

Naro bay, entered between Tabunan point and Cadulan (Kadulan) point, about 4½ miles east-south-eastward, is clear of dangers and deep in the middle ; it affords good protection except from north-westward. Cadulan point is an eroded bluff covered with jungle, with a narrow ledge at its end. Cudao (Kudao) islet, 66 feet (20^{m}1) high, lies on the edge of a bank extending about three-quarters of a mile west-south-westward from Cadulan point ; it is steep-to on its western side.

The town of Dimasalang is situated on the beach at the head of Naro

Charts 3808, 3823, 943, 1263.

Chart 3370.

bay. It is connected to the general telegraph system, and there is regular steamer communication with other ports.

Charts 3808, 3823.

The coast between Cadulan point and Caduruan (Kaduruan) point, the southern extremity of Masbate is generally clear of off-lying dangers, and has depths of from 4 to 8 fathoms (7^{m}3 to 14^{m}6), close offshore, except in the vicinity of Kansuriao point, situated about 1¼ miles south-eastward of Cadulan point, where the reef extends from half to three-quarters of a mile offshore.

Chart 962, plan of Port Kataingan.

Port Cataingan. — Dangers. — Port Cataingan (Kataingan) is entered southward of Dumurug point, about 20 miles south-eastward of Cadulan point. Dumurug point (*Lat. 11° 57′ N., Long. 124° 03′ E.*) is fringed by a reef and bank which extends about 1½ cables southward, with depths of less than 3 fathoms (5^{m}5) over it. About three-quarters of a mile south-south-eastward of the point is Baslay islet, fringed by a bank, which extends about 1¼ miles south-south-eastward, with depths of less than 5 fathoms (9^{m}1) over it. Baslay reef, with a depth of one fathom (1^{m}8) over it, lies on this bank about half a mile southward of the islet.

Ordoñez bank, with a depth of 9 fathoms (16^{m}5) over it, lies in the fairway, 8½ cables south-westward of Dumurug point.

The shores of the port are fringed with reefs and banks which extend from 1¼ to 2½ cables offshore, and there are three detached shoals lying on the eastern side of the fairway, with a least depth of about one foot (0^{m}3) on the two southern shoals, and with a rock, awash, on the northernmost. From the head of the port there are mud flats which dry, extending about 3¾ cables. The town of Cataingan (Kataingan) is situated near the head on the western side of the port, and about 3 miles north-westward of it are the Tetas de Cataingan (Kataingan) (chart 3823), two prominent rounded hills, 919 and 932 feet (280^{m}1 and 284^{m}1) high, respectively.

Anchorages.—Protected anchorage may be obtained near the head of Port Cataingan, about half a mile south-eastward of the town, in depths of from 4 to 5 fathoms (7^{m}3 to 9^{m}1). Another recommended anchorage is in the bight on the western side of the port, about a quarter of a mile north-westward of Mintag point, situated about 1¾ miles west-north-westward of Dumurug point.

Charts 3808, 3823.

Off-lying islands.—Bugtung island, 343 feet (104^{m}5) high, lies about 4½ miles south-south-eastward of Dumurug point, and 1¼ miles offshore. It is fringed by a narrow reef, and surrounded by a bank which extends one mile southward from it, with a depth of 21 feet (6^{m}4) at its extremity. At the south-eastern extremity of the island there is a hill, 330 feet (100^{m}6) high.

Balanguingue island, 110 feet (33^{m}5) high, lies 2 miles south-south-eastward of Bugtung island; it is fringed by a bank which extends about 1¼ cables from its north-western side.

Caduruan point has been described on page 348.

Chart 3809.

CEBU.—The island of Cebu (Sebu) lies between Negros on the west and Leyte and Bohol on the east. A chain of mountains containing

Charts 943, 1263.

Chart 3809.

beds of coral, traverses the entire length of the island. It is thickly populated. The rivers are small and numerous, but generally unfit for navigation. The principal exports are hemp, sugar, and tobacco.

Chart 3825.

EASTERN SIDE OF CEBU.—Coast.—Port Cebu is described on pages 459-465.

Between Bagacay (Bagakai) point (page 460), situated 54 miles southward of the northern extremity of the island, and Nailon point, 40 miles northward, the coast is generally fringed by narrow, steep-to, coral reefs, nowhere extending more than half a mile offshore. Several rivers discharge on this coast, but they are small and unimportant. Fair anchorage may be obtained by vessels with local knowledge northward of Liloan, situated about 1½ miles north-westward of Bagacay point, off Danao, Luyang, Catmon (Katmon) and Borbon, situated about 8, 13, 20, and 27 miles, respectively, northward of Bagacay point (*Lat. 10° 23′ N., Long. 124° 01′ E.*). These anchorages are generally very close in on account of the great depth.

Chart 3193, plan of Port Sebu and approaches.

The town of Liloan, which has a large church with a galvanised iron roof, standing close to the beach, is situated along the side of a channel known as the Liloan river which connects Silut lagoon with the sea ; there is a depth of not more than one or 2 feet ($0^{m}3$ or $0^{m}6$) in this channel. Liloan is connected to the general telegraph system.

A reef, with a rock awash on it, lies north-eastward of Liloan church, and about 2½ cables offshore.

Chart 3825.

Kotkot point, about 1½ miles northward of the entrance to Liloan river, and near the mouth of Kotkot river, is low and not prominent except from northward. It is bordered by a prominent beach, which extends to Liloan. In the vicinity of the mouth of Kotkot river the coastal bank extends about half a mile offshore.

Compostela village, 2 miles northward of Kotkot point, contains a church, which stands on the beach ; it is visible only between the bearings of 294° and 350°, owing to the thick coconut groves which border the coast northward of it. A railway bridge, situated half a mile northward of the village, shows plainly from eastward. The coast for one mile southward and 3 miles northward of Compostela is fringed with a narrow, steep-to, coral reef almost unbroken. There is little sand beach, the remainder of the coast being bordered mostly by gravel, with a few stretches of rocky ledges.

Danao point, about 3 miles north-north-eastward of Compostela, has a bare and steep appearance. The railway connecting Cebu and Danao passes around this point, and the embankment is prominent. The point is fringed by a dark, steep-to reef of moderate width.

Danao, the largest and most important town in the northern part of Cebu, is situated about one mile northward of Danao point. It is the terminus of the railway from Cebu. There is a prominent church standing close to the beach. The church and surrounding buildings form a group with red-tiled roofs, but owing to the thick coconut groves northward and southward of it, is only visible between the bearings of 222° and 350°. The beach in front of the town is dark sand, and there is no coral.

Charts 3810, 943, 1263.

Anchorage may be obtained by vessels with local knowledge eastward of Danao church, about a quarter of a mile offshore, in a depth of 20 fathoms ($36^{m}6$), mud and sand.

Catadman (Katadman) point, about 3 miles northward of Danao point, is formed by the wide coastal reef, and is heavily overgrown with mangroves, giving it the appearance of land. The reefs for one mile southward and northward of the point are thickly covered with mangroves and their edges are steep-to.

Port Carmen.—Port Carmen is entered on the southern side of a reef which extends about 4 cables south-south-eastward from Poo point (*Lat. 10° 35′ N., Long. 124° 02′ E.*), situated about 2 miles northward of Catadman point. The entrance, which has a width of about one cable between the 3-fathom ($5^{m}5$) lines, has a depth of 5½ fathoms ($10^{m}1$). A rocky ledge, which dries, extends eastward about half a mile from the shore towards the middle of the entrance, and forms the southern side of the port. On the south-eastern side of this ledge there is a narrow, tortuous channel leading southward, available only for small craft with local knowledge. The channel northward of the ledge has a least width of about half a cable and leads to the anchorage, which is about 3 cables in length and from half to three-quarters of a cable in width, with a least depth of 3 fathoms ($5^{m}5$).

A clump of mangroves is situated on the edge of the reef southward of Poo point and westward of it is a well defined sand spit, which dries about 2 feet ($0^{m}6$), which may be rounded closely on entering. There are no navigational marks nor prominent landmarks, but there is a prominent stranded wreck lying about half a mile northward of Poo point; vessels without local knowledge should enter with caution, being guided principally by the colour of the water on the reefs which are steep-to, but it is usually muddy and the reefs show plainly only at low water. Fish weirs are scattered over the shoal parts of the port and along the reefs.

The town of Carmen stands on the western side of the port, and is nearly concealed by trees. The church, with a nipa roof, is visible over Poo point and also from the entrance to the channel, but it is obscured from the anchorage. Cogon (Kogon) village stands at the head of the port, about half a mile northward of Carmen, and there are two other villages on the shores of the port; they each have a small stone pier where small boats can land at high water.

Anchorage.—Good protected anchorage may be obtained by vessels with local knowledge westward of the clump of mangroves mentioned above, in a depth of 5 fathoms ($9^{m}1$), or about one cable farther northward, in a depth of 4 or 4½ fathoms ($7^{m}3$ or $8^{m}2$).

Coast.—The town of Luyang stands at the mouth of the river of the same name, which discharges about 1½ miles northward of Poo point. The bar of the river can only be crossed at high water by small craft. About 2 miles northward of Luyang is Binongkalan point, which is low and composed of dark rock, and is steep-to. Binongkalan village, situated on the slope close westward of the point, consists of a group of brown native houses, and shows well from seaward.

Between Binongkalan point and Catmon point, 6 miles northward, there are several small villages. Catmon (Katmon) point is low and composed of dark sand and gravel, and is bordered by thick coconut groves on either side. Bao river flows out at the point. The town of

Chart 3825.

Catmon (Katmon) is situated on the coast about three-quarters of a mile southward of the point; it is almost entirely concealed from seaward by coconut palms. About half a mile southward of the point is Catmon church, with a prominent tower surmounted by a dome at the southern end of the building, and with a galvanised iron roof.

Between Catmon point and Bingkay (Bingkai) point (*Lat. 10° 48′ N., Long. 124° 02′ E.*), about 4 miles northward, is Sogod bay, at the head of which there is a peculiar narrow ravine with steep sides extending nearly one mile inland, and up which the sea enters for about 1½ cables. About half a mile southward of this ravine is a prominent cliff, 56 feet ($17^{m}1$) high. A reef extends from half a cable to 1½ cables offshore from here to one mile southward of the town of Sogod.

Sogod, at the head of Sogod bay, shows up well, and has a church, with a galvanised iron roof, standing on a slight elevation behind the town and is noticeable from north-eastward and eastward. There is a small stone pier, with a depth of from 3 to 4 feet ($0^{m}9$ to $1^{m}2$) at its head.

Bingkay point is a rocky bluff, about 20 feet ($6^{m}1$) high, covered with small trees and brushwood. A series of these bluffs with an occasional short strip of white sand beach borders the coast for one mile on each side of the point.

Borbon is a small town in a bend in the coast at the mouth of the Jimuguit (Himuguit) river, about 2¾ miles northward of Bingkay point. A church with a galvanised iron roof, standing on an elevation southward of the town, is a good landmark. Jimuguit river can be entered only by small boats at high water. The coastal reef northward and eastward of Borbon is extensive and backed by a thick growth of mangroves. The usual anchorage for vessels with local knowledge is about 1¼ cables from the edge of the coastal reef, in a depth of 20 fathoms ($36^{m}6$), mud, with the church bearing 294°.

Managao point, about 3 miles north-north-eastward of Borbon, is low, rocky, and steep-to. The hills slope down to the coast here and rise gradually to elevations of 300 and 400 feet ($91^{m}4$ and $121^{m}9$) at a distance of one mile inland. Managao point is very prominent from northward or southward; close southward of it there is a small cove which affords anchorage for small craft with local knowledge.

Bantulin point, about 2 miles northward of Managao point, is a steep clay bluff, about 50 feet ($15^{m}2$) high, inland of which the land rises to an elevation of over 400 feet ($121^{m}9$), within half a mile of the point. About 2½ miles northward of Bantulin point is Pamoboan point, the coast between them being indented by several small bays which are foul. The town of Tobogan is situated about one mile southward of Pamoboan point. Between Pamoboan point and Saac (Saak) point, about 2¼ miles northward, the coast consists of a bold rocky ledge, from 20 to 30 feet ($6^{m}1$ to $9^{m}1$) high, less than a mile inland of which the land rises steeply to an elevation of 400 feet ($121^{m}9$). Nailon point, 4 miles northward of Saac point, is low and wooded, and fringed by a narrow, steep-to reef.

Off-lying islets and dangers.—Light.—Capitancillo islet (*Lat. 11° 00′ N., Long. 124° 06′ E.*), 3½ miles eastward of Saac point, is of coral formation and about 15 feet ($4^{m}6$) high. It is steep-to on the western side; reefs extend about half a mile northward and southward,

Charts 3808, 3810, 943, 1263.

Chart 3825.

and a short distance eastward from it. The channel between the islet and the coast of Cebu is deep and clear of dangers.

A light is exhibited, at an elevation of 98 feet (29$^{\mathrm{m}}$9), from a black steel tower, with a white lantern over a white dwelling with a red roof, on Capitancillo islet (*Lat. 11° 00′ N., Long. 124° 06′ E.*).

A reef, with a depth of 15 feet (4$^{\mathrm{m}}$6) over its southern end, and steep-to, lies about three-quarters of a mile northward of Capitancillo islet.

Ormoc (Ormok) shoal, with a least depth of 27 feet (8$^{\mathrm{m}}$2) over it, lies about 3¼ miles north-eastward of Capitancillo islet. This shoal should be avoided as there may be some coral heads on it with less depths than charted.

Calangaman (Kalangaman) islet, about 11 miles north-eastward of Capitancillo islet, is 10 feet (3$^{\mathrm{m}}$0) high, wooded, and fringed by reefs which partly dry. A bank, with depths of less than 5 fathoms (9$^{\mathrm{m}}$1) over it, extends half a mile westward from it. During the North-east monsoon good anchorage sheltered from the sea may be obtained by vessels with local knowledge, in a depth of 8 fathoms (14$^{\mathrm{m}}$6), off the southern side of Calangaman islet.

Nunez shoal, about 2 miles south-westward of Calangaman islet, is a small coral patch, with a least depth of 3 fathoms (5$^{\mathrm{m}}$5) over it.

Bogo bay. — Light. — Beacons. — Bogo bay, entered between Nailon point and Malontod point, about 5½ miles northward, is much encumbered with reefs, most of which are awash. Between Malontod point and Tindug point, 1¾ miles south-south-westward, there is a bluff rocky shore, the bluffs being about 15 feet (4$^{\mathrm{m}}$6) high; the remainder of the shores are mostly bordered with mangroves.

The navigable entrance is a break in the reef about 1¾ miles north-north-westward of Nailon point and is about one cable wide between the 3-fathom (5$^{\mathrm{m}}$5) lines and deep. About three-quarters of a mile westward of the entrance the channel divides, one arm, of no value to navigation, extending north-westward, and the main channel extending south-westward for three-quarters of a mile, where it again divides, one arm extending towards the entrance to the Daijagon (Daihagon) canal and the other extending southward and gradually shoaling towards the town of Bogo, where there is a stone pier which can be reached by boats at high water. In the middle of the reach trending south-westward is a small coral patch, with a least depth of 3 feet (0$^{\mathrm{m}}$9) over it, which should be passed on its north-western side.

A light is exhibited, at an elevation of 13 feet (4$^{\mathrm{m}}$0), from a white square concrete beacon, with red diamond-shaped marks, on the northern side of the entrance to Bogo bay.

A white wooden beacon, 12 feet (3$^{\mathrm{m}}$7) high, with a white square topmark with a black centre, stands on the southern side of the channel about three-quarters of a mile from the entrance. Another beacon, similar to the above, stands on the 3-foot (0$^{\mathrm{m}}$9) patch in the middle of the southern arm, about half a mile farther south-westward.

On a clear day, at low water, the reefs are plainly defined, showing bright green, but with the sun in the west and the tide high, it is difficult to distinguish the reefs at the entrance. There are numerous fish traps on the reefs, but as they are frequently moved they are of little assistance to the navigator. During the North-east monsoon, when the wind is strong, there is a heavy sea, which, combined with

Charts 3808, 3810, 943, 1263.

Chart 3825.

the tidal stream which runs down the coast at a considerable rate, makes it hazardous to enter without good way on the vessel.

Anchorage.—Fairly good anchorage may be obtained by vessels with local knowledge south-westward of the 3-foot (0^m9) patch marked by a beacon, about 1¼ miles northward of Bogo, where the channel widens to about 1¾ cables between the 3-fathom (5^m5) lines, in depths of from 5 to 6 fathoms (9^m1 to 11^m0), mud, well protected from heavy seas, but exposed to the wind between north-north-east, through east to east-south-east.

Coast.—From Malontod point (*Lat. 11° 09′ N., Long. 124° 02′ E.*) to Campatoc (Kampatok) point, about 7 miles northward, the coast is low, bordered with mangroves, and fringed by a reef, which extends three-quarters of a mile offshore in places.

Campatoc (Kampatok) reef, with a least depth of one fathom (1^m8) over it, lies about 1¾ miles southward of Campatoc point and about three-quarters of a mile offshore. Between it and the coastal reef there is a channel about a quarter of a mile wide, with a depth of 8 fathoms (14^m6) in the middle. Bulalaqui point, bearing 343°, open eastward of Campatoc point, leads eastward of Campatoc reef.

Charts 3825, 3823.

Between Campatoc point and Bulalaqui (Bulalaki) point, the northern extremity of Cebu, there is a bay filled with reefs, the greater part of which dry. The coastal reef extends from about 4 cables eastward of Campatoc point in a direct line to the eastern side of Bulalaqui point. Bulalaqui point is a cliff, about 90 feet (27^m4) high, rising steeply inland to 140 feet (42^m7), and is steep-to on its northern side.

Off-lying islands and dangers.—Lights.—Chocolate islet, about one mile northward of Bulalaqui point, is 138 feet (42^m1) high, and wooded; it is steep-to and clear of dangers, and is a good mark for navigating the channels between Cebu and Malapascua island.

A light is exhibited on Chocolate islet.

Malapascua island, 3¾ miles north-eastward of Bulalaqui point, is 78 feet (23^m6) high in the north-eastern part, and covered with small trees and bushes. Its northern, eastern, and southern sides are fringed with reefs and shoals which extend about half a mile offshore. The coast is a succession of rocky headlands with many off-lying pinnacle rocks. About 4 cables south-westward of the south-western point of the island there is an islet, 25 feet (7^m6) high and several rocks, from 3 to 14 feet (0^m9 to 4^m3) high. Close off the north-western point of the island there is a rocky islet, 18 feet (5^m5) high. A rock, one foot (0^m3) high, lies half a mile northward of the same point, and a rock, awash, lies nearly half a mile eastward of the one-foot (0^m3) rock.

A light is exhibited, at an elevation of 112 feet (34^m1), from a white steel framework tower, near the north-western point of Malapascua island.

Good anchorage may be obtained by vessels with local knowledge during the North-east monsoon, in a depth of 10 fathoms (18^m3), about half a mile south-westward of the light-structure.

A shoal, with a depth of 7 fathoms (12^m8) over it, lies about 4 miles north-westward of Malapascua island.

Monad shoal, with a least depth of 5½ fathoms (10^m1) over it, is an extensive shoal lying about 4½ miles east-south-eastward of Malapascua island; it consists of boulders and sand.

Charts 3808, 3810, 943, 1263.

Chart 3825.

CAMOTES ISLANDS.—Camotes islands, consisting of Pacijan (Pasihan), Poro, and Ponson islands, and Talong islet (*Lat. 10° 43′ N., Long. 124° 19′ E.*), lie between the islands of Cebu and Leyte, and northward of Bohol. They are generally fringed with narrow, steep-to coral reefs. The channel between them and Leyte is deep and clear of dangers. There are no good anchorages in the group.

The islands form part of the province of Cebu. They contain four small towns and a number of villages of little commercial importance.

Pacijan, the westernmost island, is 811 feet (247^{m}2) high in the southern part, and near the northern end is a lower hill; between these hills is Lake Lanao, which is brackish, with a depth of about 2 fathoms (3^{m}7). The town of San Francisco is situated on the eastern extremity of the island, and is connected with Poro island by a bridge. The bays formed northward and southward of the town by the eastern side of Pacijan and the western side of Poro are nearly filled with reefs which dry for a distance of about one mile from the bridge in either direction.

Talong islet, 75 feet (22^{m}9) high, lies about 3 cables northward of the north-western point of Pacijan. The navigable channel between it and Pacijan is reduced by reefs on either side to a width of about 1½ cables.

Poro island, lying close eastward of Pacijan island, is fringed by a narrow, steep-to coral reef, except on the northern side. Mount Three Peaks, near the southern side of the island, is 1,282 feet (390^{m}8) high, and is the summit. The town of Tudela and the village of Poro, 4 miles westward of it, are situated on the southern side of the island. Hermosa bank, with a depth of 39 feet (11^{m}9), over it, and steep-to, lies about one mile eastward of Villa Hermosa point, the eastern extremity of Poro island.

Kawit (Kauit) strait, between Poro and Ponson islands, is about 2 miles wide, but the navigable channel which is deep, is reduced to about three-quarters of a mile by Poro shoal. At times the tidal streams set through Kawit strait at a rate of from 2 to 3 knots. Poro shoal is a coral reef, with a least depth of 7 feet (2^{m}1) over it, extending about 1½ miles from the north-eastern side of Poro island. Small craft with local knowledge may pass between the shoal and Poro island in a depth of 4 fathoms (7^{m}3), by keeping about 3 cables from the latter.

Ponson island, 726 feet (221^{m}3) high, is fringed by a reef, which extends not more than a quarter of a mile offshore, except on the south-eastern side, where there is a small bight, from which the reef extends about 6 cables. The town of Pilar is situated at the north-eastern end of the island. A stone mole, with a hut in the middle, extends from the front of the town, and has a depth of 8 feet (2^{m}4) at its head. Kawit (Kauit) village stands on a prominent sandy beach on the south-western point of the island.

Anchorages.—The best anchorage amongst the Camotes islands for vessels with local knowledge, is off Tudela, in depths of from 7 to 15 fathoms (12^{m}8 to 27^{m}4), mud and coral. A similar anchorage may be obtained off Poro village, but both of these anchorages are exposed to southerly winds.

Vessels with local knowledge may obtain anchorage off Kawit village, but necessarily very close in on account of the great depth. This anchorage should be approached cautiously as the bank is very steep.

Charts 3808, 3810, 943, 1263.

Chart 3825.

In fine weather an indifferent anchorage may be obtained off the end of the mole at Pilar (*Lat. 10° 48′ N., Long. 124° 34′ E.*), in a depth of 19 or 20 fathoms ($34^{m}7$ or $36^{m}6$). In case of necessity, anchorage may be had off Lanao and Dapdap, on the western side of Ponson.

Tidal streams.—The south-going tidal stream along the western side of Leyte turns eastward through the channel between Ponson island and Calunangan point, northward of it, and then curves around the island and sets southward. The north-going stream, which has entered by Surigao strait, meets the south-going stream about 5 miles southward of Camotes islands.

Chart 3810.

LEYTE.—The island of Leyte, between Cebu and Samar, is generally mountainous, but contains several large and fertile valleys. Several of the mountains are the extinct craters of volcanoes, and are covered with forests. The climate, though hot, is healthy. The rivers are small and unfit for navigation. The chief products are hemp and copra. Tacloban, the capital and principal port, is situated on the north-eastern coast, at the southern entrance to San Juanico strait.

Chart 3825.

WESTERN SIDE OF LEYTE.—Coast.—The western side of Leyte from Ormoc bay to Green point, the south-western extremity of the island, is described on page 479.

The coast northward of Ormoc bay is mostly safe and steep-to, the fringing reef extending not more than half a mile offshore, except between Duljugan point, situated about 8 miles west-north-westward of Calunangan point, and Port Palompon, 8 miles northward, where it extends about 2 miles, and on which lie several islands covered with mangroves. (*See* page 409.) A chain of mountains runs parallel with the coast about 5 miles inland. The highest peak in the island is Mount Majuyag (Mahuyag), 4,422 feet ($1{,}347^{m}8$) high, about 20 miles east-north-eastward of Calunangan point.

Calunangan (Kalunangan) point, the western entrance point of Ormoc bay, is low, flat, fringed with mangroves, and bordered by a narrow„ steep-to coral reef. The coast in this vicinity may be safely approached to a distance of half a mile. About 2½ miles westward of Calunangan point is Apali point, and about 1¾ miles north-westward of the latter is the entrance to Matlang bay, which is well sheltered from all except southerly winds. The anchorage area is restricted by reefs extending from both sides and at the head. Matlang village is situated on the eastern entrance point.

Dupon bay, entered between Catiyoman (Katiyoman) point, situated 3 miles north-westward of Apali point, and Sacay (Sakai) point, about 1½ miles farther north-westward, affords good anchorage to vessels with local knowledge, in a depth of 8 fathoms ($14^{m}6$), about half a mile from the western shore. The entrance is deep, the depths decreasing towards the head, which is foul. Quiot (Kiot) village is situated on the eastern shore. Duljugan (Dulhugan) point (*Lat. 10° 55′ N., Long. 124° 23′ E.*) is low and flat, and its southern side is steep-to. Thence for about 8¾ miles northward, a reef extends as much as 2 miles offshore; mangroves grow on this reef westward of Duljugan point and surround an islet lying about three-quarters of a mile offshore, giving it the appearance of forming part of the point. When rounding this reef from northward Canaguayan point, situated 9 miles northward of Duljugan point, should not be brought to bear less than 014°, until Duljugan point bears less than 111°.

Port Palompon.—Light.—Port Palompan is formed by a narrow channel between the western coast of Leyte southward of Canaguayan point, and the reef, the northern end of which lies 4 cables southward of the point. The only entrance is between Canaguayan point and the reef, the southern end of the channel being closed by reefs covered with mangroves.

Canaguayan (Kanaguayan) point is low, flat, covered with coconut palms, and fringed with mangroves. It is bordered by a reef which extends 4 cables off, and from its north-western side, a bank with a depth of 21 feet (6^m4) at its outer end, extends about 6½ cables offshore.

Taboc (Tabok), and Gumalac (Gumalak) island southward of it, are low, wooded islands, lying on the same reef, which extends in some places more than half a mile westward of them. Cabgan (Kabgan), a similar but smaller island lying southward of Gumalac, is also surrounded by reefs which extend over half a mile seaward.

The entrance between the reefs fringing Canaguayan point and the reef which extends about half a mile north-westward from the north-western side of Taboc island is about 2½ cables wide, with a depth of more than 20 fathoms (36^m6). The passage becomes narrower as it trends southward and shoals gradually off the wharf where it is about 1¼ cables wide, with a depth of 9 fathoms (16^m5). From this point the depths gradually decrease until off Gumalac island, where there is only 2 fathoms (3^m7).

The town of Palompon is situated on the eastern side of the port, about three-quarters of a mile south-eastward of Canaguayan point. There is a wharf with a **T**-head which had, in 1938, a least depth of 22 feet (6^m7) alongside.

A light is exhibited, at an elevation of 35 feet (10^m7), from a white concrete pillar, about a quarter of a mile north-north-eastward of the wharf at Palompon.

Anchorage.—Directions.—Anchorage may be obtained by vessels with local knowledge, in a depth of about 9 fathoms (16^m5), mud, about 1¾ cables south-westward of the wharf at Palompon.

To enter Port Palompon from a position with Canaguayan point bearing 046°, a vessel should steer for the light pillar, bearing 105°, keeping a good look out for the reefs on either side, which show up well at low water, and are usually marked by fish traps and bamboos with bushy tops. This course leads midway between the reefs on either side. When the wharf bears 140° the vessel should steer for it on that bearing and anchor off it in mid-channel.

Coast.—Between Canaguayan point (*Lat. 11° 04′ N., Long. 124° 22′ E.*) and Canapog point, about 10 miles northward, there are no off-lying dangers, and the coast can be approached to half a mile except near Canaguayan point.

Villaba village stands at the head of Villaba bay, which is entered about 9 miles northward of Canaguayan point. There is a landing pier about half a mile south-westward of the village, and has a depth of 5 feet (1^m5) alongside. The village is a regular port of call for vessels

Chart 3825.

from Cebu, and it is connected to the general telegraph system. Anchorage may be obtained by vessels with local knowledge, in a depth of 5 fathoms ($9^{m}1$), at the entrance to the bay, or closer in, about 1½ cables from the end of the pier, in a depth of 3 fathoms ($5^{m}5$).

A yellow rock, 60 feet ($18^{m}3$) high, lies close offshore about 4 cables southward of Canapog point; the rock is bare and sharp-pointed.

Silad bay, entered close northward of Canapog point, is about three-quarters of a mile wide, and its shores are fringed by a wide reef, which dries. Silad village stands on the southern shore of the bay.

Charts 3825, 3823.

Between Silad bay and Sangabon point, 10 miles northward, there are several small bays and a number of coves, the entrances to which are generally marked by prominent bluffs, from 50 to 75 feet ($15^{m}2$ to $22^{m}9$) high.

Campopo (Kampopo) bay, entered about 2¼ miles northward of Silad bay, is mostly filled with reefs and shoals. Masisi village stands at its head. Dauajon (Dauahon) islet, 84 feet ($25^{m}6$) high, lies about one mile south-westward of Burabud point, the southern entrance point of Campopo bay, and three-quarters of a mile offshore. The channel between it and the coast of Leyte is deep and clear of dangers. The islet is steep-to, except on its north-western side, where there is a depth of 27 feet ($8^{m}2$) at a distance of a quarter of a mile. Tabango bay, lying north-westward of Campopo bay, is separated from it by Liog point, over 100 feet ($30^{m}5$) high; it is nearly filled by reefs. Tabango village stands at its head.

Pulingbato hill, 750 feet ($228^{m}6$) high, situated about 1¼ miles northward of the northern entrance point of Tabango bay and three-quarters of a mile inland, is an excellent mark. The bluffs and rocks westward of it are higher and steeper than those at the entrances to the bays.

Arevalo bay, entered about 4 miles northward of Tabango bay, is nearly filled with reefs and shoals. The northern entrance point is a bare cliff. The village of the same name is situated in the south-eastern part of the bay. There is a stone mole on the southern side of the bay. Vessels with local knowledge may obtain anchorage, in a depth of 3 fathoms ($5^{m}5$), about one cable northward of the mole. San Isidro bay, entered between Sangabon point and Matung point, about 1¼ miles north-north-westward, affords good anchorage to vessels with local knowledge during the North-east monsoon, in a depth of 3 fathoms ($5^{m}5$), but the head is filled with shoals and mud flats which dry. The town of San Isidro, at the head of the bay, has a stone mole extending from it, with a depth of 8 feet ($2^{m}4$) at its head. There is a prominent red-roofed shed on the mole.

Chart 3823.

Between Matung point and Dungun point, 8 miles north-westward, and thence to Rabin point, 2 miles north-eastward, the coast is generally fringed by a narrow, steep-to reef. Tinago and Daja (Daha) are two small coves, encumbered with reefs, on this stretch of coast; villages of the same names stand at their heads.

Rabin point (*Lat. 11° 34′ N., Long. 124° 19′ E.*), the north-western extremity of Leyte, is the termination of a high, wooded promontory. A bank, with a depth of 7 fathoms ($12^{m}8$) at its outer end, extends three-quarters of a mile northward from the point.

Charts 3808, 3810, 943, 1263.

Chart 3823.

Gigantangan island, 150 feet ($45^{m}7$) high, and wooded, lies about 2¼ miles westward of Rabin point; it is fringed by a narrow, steep-to reef. The channel between it and the coast of Leyte is about 1½ miles wide, deep and clear of dangers.

NORTHERN SIDE OF LEYTE.—Coast.—Between Rabin point and Uson point, about 7½ miles south-eastward, the coast is generally steep-to and clear of dangers. Leyte bay lies with its entrance between Uson point and Manoc (Manok) point, about 3¾ miles south-eastward. The greater part of the bay is filled with shoals, but there is a narrow tortuous channel, with a least depth of 7 feet ($2^{m}1$), leading to the mole at the town of Leyte at the head of the bay. There is sufficient depth at the head of the mole at high water for small craft. Palapay (Palapai) river discharges into the head of Leyte bay.

At Calubian (Kalubian) village, 2¼ miles south-eastward of Uson point, there is a wooden pier with a **T**-head, prolonged by a stone mole, with a depth of 8 feet ($2^{m}4$) at its head. Vessels from Cebu call regularly.

Biliran island.—Biliran island, off the northern side of Leyte, from which it is separated by Biliran strait, is very mountainous, and the hills and peaks are densely wooded. Mount Suiro, the highest point on the island, is in the south-eastern part, and has an elevation of 4,265 feet ($1{,}300^{m}0$). Mount Naliwatan, in the northern part, is 4,230 feet ($1{,}289^{m}3$) high, and is very prominent, having the shape of a cone when seen from westward. The entire coast of the island is clear of dangers, and can be approached to a distance of half a mile except in Biliran strait.

Western side of Biliran island.—Islets and dangers.—Buhoc (Buhok) point, the western extremity of the island, is 360 feet ($109^{m}7$) high, steep-to, and clear of dangers. A rock, 29 feet ($8^{m}8$) high, lies about 3 cables northward of Buhoc point. Tincansan (Tinkansan) islet, 260 feet ($79^{m}2$) high, lies about 1½ cables south-westward of the same point, with a narrow, deep channel between.

Between Buhoc point and the western entrance to Biliran strait, about 15 miles south-south-eastward, the coast is generally low, with rocky points and gravel beaches in the coves between.

From Buhoc point to Telegrafo village, about three-quarters of a mile south-eastward, and for a quarter of a mile beyond, the coast is rocky. Just westward of Telegrafo there are some well defined reddish-brown bluffs, about 200 feet ($61^{m}0$) high.

Calutan (Kalutan) islet, 126 feet ($38^{m}4$) high, bold, and rocky, lies about 3 miles southward of Buhoc point, and about one mile from the western side of Biliran island. Pilar rocks, 6 feet ($1^{m}8$) high, lie about 8 cables south-eastward of Calutan islet. Caygan islet, 133 feet ($40^{m}5$) high, bold, and rocky, lies about three-quarters of a mile westward of Almeria village, situated 4¼ miles south-eastward of Buhoc point. The channel between it and the coastal reef off the village is over a quarter of a mile wide, and deep.

The town of Naval stands on the coast 3¾ miles south-south-eastward of Almeria village. South-eastward of Saban point (*Lat. 11° 32′ N., Long. 124° 24′ E.*), situated about 1½ miles south-south-eastward of Naval, shingle beaches alternate with small coves fringed with mangroves.

Charts 3808, 3810, 943, 1263.

Chart 3823.

A small detached shoal, with a depth of 15 feet (4m6) over it, lies about one mile south-eastward of Saban point and half a mile offshore.

Anchorages.—Small vessels with local knowledge may obtain anchorage, in a depth of 3½ fathoms (6m4), about 1½ cables from the head of the mole at Naval.

Anchorage may be obtained by vessels with local knowledge, in a depth of 3 fathoms (5m5), mud, about a quarter of a mile westward of Culajit (Kulajit) islet, in Biliran strait, situated about 6½ miles south-eastward of Saban point. It is not prudent to anchor farther northward, as the depths decrease rapidly.

Northern and eastern sides of Biliran island.—Islets and dangers.—The northern and eastern sides of Biliran island are steep-to and free from dangers. There are several towns on this coast, the principal of which are Culaba (Kulaba) and Caibiran (Kaibiran), about 1¼ and 7 miles, respectively, south-south-eastward of Amambahag (Mambahab) point, the north-eastern extremity of the island. There is communication by steamer between these towns and Iloilo and Cebu.

An abundant supply of good water may be obtained from a spring on the east coast of Biliran, about a quarter of a mile southward of Gamay (Gamai) point, the eastern extremity of the island. The locality may be identified by a rock painted white, reported to be visible from a distance of 3 or 4 miles. The water is brought from the spring by a 2½-inch pipe, terminating near the beacon. To obtain water, vessels should steer for the beacon bearing 293°, anchor in a depth of 20 fathoms (36m6), and haul the stern into a depth of about 3 fathoms (5m5) by means of lines to the shore. From this position about 300 feet (91m4) of hose will be required to reach the pipe.

Tagampul islet, 120 feet (36m6) high, lies about 2 miles northward of Buhoc point. A rocky patch, with a depth of one fathom (1m8) over it, lies about 2 cables north-eastward of the eastern extremity of the islet, and a 27-foot (8m2) patch lies close northward of the rocky patch.

Remus rock, with a depth of 9 feet (2m7) over it, lies about half a mile northward of Tagampul islet (*Lat. 11° 43′ N., Long. 124° 20′ E.*).

Tomasa islet, 40 feet (12m2) high, lies about 6 cables south-south-eastward of Tagampul islet; there is a shoal close off its north-eastern side.

Genuruan islet, 190 feet (57m9) high, lies about 1½ miles north-eastward of Buhoc point, and about 3 cables from the north-western coast of Biliran.

Biliran strait.—Light.—Beacon.—Biliran strait is encumbered with several islands and reefs; the navigable channel, with a least depth of 16 feet (4m9), and a least width of 75 yards (68m8), lies southward of Poro island. In the western approach there is a least depth of 10 feet (3m0).

Poro islet lies about 1¼ cables southward of the southern extremity of Biliran island, to which it is connected by a reef which partly dries; it is rocky and bold, and on its north-eastern side is fringed with mangroves; it is planted with hemp and coconut trees. Lagnay islet, covered with bushes, lies on the same reef, about 2 cables north-eastward of Poro islet. Culajit islet lies about 2 cables westward of Poro islet; it is rocky, covered with mangroves and is nearly awash at high water.

A light is exhibited, at an elevation of 35 feet (10m7), from a white

Charts 3808, 3810, 943, 1263.

Chart 3823.

concrete beacon on the edge of the reef extending from the northern coast of Leyte at the narrowest part of Biliran strait.

A white concrete beacon, surmounted by a cone, stands on Culajit islet, 2 cables westward of Poro islet.

Biliran is a small town situated on the southern side of Biliran island, about 4 cables north-westward of the southern extremity. A bank, which dries, and with a depth of 5 fathoms ($9^{m}1$) over its edge, extends a quarter of a mile southward from the town.

About 2 miles eastward of the southern extremity of Biliran island is Magbagun point (*Lat. 11° 28′ N., Long. 124° 31′ E.*), the eastern entrance point of Magbagun cove. A bank extends about half a mile southward from both entrance points, leaving a deep channel between, 2 cables wide, leading into the cove.

Anchorages.—Directions.—Good sheltered anchorage may be obtained by vessels with local knowledge, in a depth of 11 fathoms ($20^{m}1$), mud, in Magbagun cove.

In approaching the eastern entrance to Biliran strait, the southern side should be favoured to avoid the reef and shoal water extending from the south-eastern end of Poro islet. In the narrowest part of the strait the greatest depth is about a quarter of a cable southward of Poro islet. Caution should be exercised in using this strait, as at times the tidal stream runs through it at a considerable rate.

Carigara bay. — Light. — Carigara (Karigara) bay is entered between Talairan point, situated about 4 miles south-eastward of the light-structure on the southern side of Biliran strait, and Baluarte point, 16½ miles eastward of Talairan point. The bay is clear of dangers outside a distance of one mile offshore, and has considerable depths. The western shore is steep-to. Pacdahauan (Pakdahauan) peak, 2,088 feet ($636^{m}4$) high, about 1¼ miles westward of Talairan point, and another peak 1,871 feet ($570^{m}2$) high, lying three-quarters of a mile southward of Pacdahauan peak, are good marks.

Calumpijan (Kalumpihan) islet, about 100 feet ($30^{m}5$) high, lies about one mile eastward of Talairan point, from which it is separated by a deep channel, clear of dangers.

The town of Carigara (Karigara) is situated at the head of the bay, and Barugo, about 3¼ miles north-eastward of it. The coastal bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends about three-quarters of a mile offshore in front of the latter town. Carigara is connected to the general telegraph system.

A light is exhibited, at an elevation of 29 feet ($8^{m}8$), from a white concrete pillar, at Carigara.

A shoal, with a depth of 15 feet ($4^{m}6$) over it, lies one mile offshore and 1½ miles westward of Banug point, situated 3¾ miles north-eastward of Barugo. A rock, awash, lies about a quarter of a mile inshore of this shoal.

Anchorages.—Vessels may obtain anchorage about three-quarters of a mile offshore abreast the town of Carigara. The coastal bank extends about half a mile offshore.

Anchorage may be obtained, in a depth of 8 fathoms ($14^{m}6$), about one mile offshore, off Barugo, with a large white storehouse bearing 170°.

Chart 3840.

Janabatas channel.—Janabatas channel, entered between Balu-

Charts 3808, 3810, 943, 1263.

Chart 3840.

arte point and Diutay point, about 2¾ miles north-north-eastward, is described on page 581.

Baluarte point (*Lat. 11° 26′ N., Long. 124° 49′ E.*) is steep-to and clear of dangers on its western side. It rises to an elevation of 470 feet ($143^{m}3$) about half a mile inland, and about 2¼ miles south-south-eastward of it is Mount Busay (Busai), 1,830 feet ($557^{m}8$) high, which is a good mark for making the entrance to the channel. Calaguan (Kalaguan) island, 188 feet ($57^{m}3$) high, lies on the north-eastern side of Baluarte point, to which it is connected by a reef which mostly dries.

Diutay (Diutai) point is the western extremity of an islet, 82 feet ($25^{m}0$) high, which is connected to the western side of Samar by a reef which dries. The islet is steep-to and clear of dangers on its seaward side.

WESTERN SIDE OF SAMAR.—Coast.—Between Diutay point and Dulugdug point, 2½ miles north-north-westward, the coast is indented, but bold and clear of dangers.

Islands and dangers.—Daram channel, separating the southern end of Daram island from the coast of Samar, has a least depth of 3 fathoms ($5^{m}5$) in the fairway at its northern end (chart 3823), about one mile northward of Aocon islets (*see* below) and has a least width of about 3 cables. Bacsal (Baksal) islands are two wooded islands lying close westward of the southern extremity of Daram island; the channel between them and Daram is clear of dangers except for a 15-foot ($4^{m}6$) patch lying about a quarter of a mile north-eastward of the western island.

Aocon (Aokon) islets are two wooded islets, connected by a sand spit, lying at the north-eastern end of Daram channel, about three-quarters of a mile eastward of the southern part of Daram island; the northern islet is 225 feet ($68^{m}6$) high. The channel generally used lies eastward of the islets. Laguinit island, 332 feet ($101^{m}2$) high, lies about half a mile south-south-eastward of Aocon islets.

Talalora, on the Samar shore of Daram channel, about 1¼ miles north-eastward of Dulugdug point, has a pier, with a depth of 11 feet ($3^{m}4$) alongside.

Chart 3823.

Daram island is much indented, and is nearly divided at about 4¾ miles from its southern extremity, by an isthmus 340 feet ($103^{m}6$) high. About 1½ miles south-south-westward of the isthmus the island is 1,258 feet ($383^{m}4$) high. Lying close off the island are a number of high islets; Badian islet, 295 feet ($89^{m}9$) high, lies about 5½ miles north-north-westward of the Bacsal islands. Danaodanauan islet and Bancalayot (Bankalayot) islet lie off the northern extremity of Daram island.

Patabunan reef, which dries, lies about 3 cables south-westward of Canauayan (Kanauayan) point, at the north-western end of Daram island.

Buad island, eastward of Daram island, is 1,174 feet ($357^{m}9$) high near the southern end and well wooded. It is separated from Daram island by Zumarraga channel, with a least depth of 34 feet ($10^{m}4$) in the middle. The town of Zumarraga, at the south-western end of the island, is sheltered by high hills. There is a concrete landing pier, with a depth of 11 feet ($3^{m}4$) alongside, at Zumarraga.

Charts 3808, 3810, 943, 1263.

Chart 3823.

Buad channel, between the southern end of Buad island and Guintarcan (Guintarkan) island, 490 feet ($149^{m}3$) high, about one mile south-eastward, is the channel usually taken by vessels proceeding from Daram channel to Catbalogan (page 416).

Buntay (Buntai) islet (*Lat. 11° 38′ N., Long. 124° 50′ E.*), 106 feet ($32^{m}3$) high, lies close off the south-western point of Buad island, and Jinatblan (Hinatblan) reef lies 3½ cables southward of the islet. Poro island, 195 feet ($59^{m}4$) high, and Marapilit island, 170 feet ($51^{m}8$) high, lie about 1¼ miles south-south-westward and 4 cables south-westward, respectively, of Gaang point, the eastern extremity of Buad island.

Basiao islands are three small islands lying about 1¼ miles northward of Gaang point. The northern island, 190 feet ($57^{m}9$) high, is wooded; the middle one, 131 feet ($39^{m}9$) high, is wooded along its eastern side, and the southern and smallest one is low and covered with bushes. The northern and middle islands are connected by a shell beach, which dries about 5 feet ($1^{m}5$), and between the middle and southern islands is a rocky ledge, which dries about 2 feet ($0^{m}6$). On the eastern side of the northern and middle islands are some prominent white, coral cliffs, from 30 to 80 feet ($9^{m}1$ to $24^{m}4$) high. A narrow rocky ledge extends nearly 1½ cables westward from the southern island.

Majaba (Mahaba) island, 301 feet ($91^{m}7$) high, and steep-to, lies 7 cables north-westward of Basiao islands, but the navigable channel between them is reduced to a width of about 3 cables by a spit, with a least depth of 16 feet ($4^{m}9$) over it, extending half a mile north-westward from the middle of the Basiao islands. The channel is frequently used by coasting steamers.

Cambalot (Kambalot) reef, which dries about 5 feet ($1^{m}5$), is a sharp, rocky ledge, lying about half a mile from the middle of the northern side of Buad island.

Parasan island, 446 feet ($135^{m}9$) high, lies close eastward of the northern end of Daram island, being separated from it by a narrow channel, with a least depth of 15 feet ($4^{m}6$). The island is steep-to, and at its northern end there is a remarkable peninsula connected to the remainder of the island by a narrow isthmus.

Taratara islet, which is steep-to, lies half a mile north-north-eastward of the north-eastern point of Parasan island.

Chart 1622, plan of Parasan harbour.

Anchorages.—Parasan harbour, on the southern side of the island of the same name, is a well sheltered harbour, in which anchorage may be obtained, in depths of from 10 to 15 fathoms ($18^{m}3$ to $27^{m}4$), mud. This anchorage can easily be approached from eastward.

Chart 3823.

Good sheltered anchorage may be obtained in some of the numerous bays around Daram island, according to the season of the year.

Anchorage may be obtained in the bight off the town of Zumarraga. Deep draught ships can approach this anchorage only from the northward.

Coast.—**Light.**—Villareal and Maqueda (Makaida) bays indent the coast of Samar between Guintarcan island and Madalonot point, 7¾ miles northward. They are shallow and are of little value to navigation. Their shores are, in most places, fringed with mangroves, and from their heads mud flats, which dry, extend a considerable distance. The town of Calbiga (Kalbiga) is situated about 6½ miles

Charts 3808, 3810, 943, 1263.

Chart 3823.

up the Calbiga (Kalbiga) river, which discharges at the point, which separates Villareal and Maqueda bays. The town of Wright is situated at the head of Maqueda bay, and there are several villages on the shores of both bays.

A light is exhibited, at an elevation of 37 feet ($11^{m}3$), from a concrete tower, on the northern Uacac (Uakak) island at the mouth of Calbiga river.

Chart 1622, plan of Katbalogan anchorage.

Catbalogan anchorage. — Dangers. — Buoys. — Light. — Catbalogan (Katbalogan) anchorage is situated off the town of the same name, which stands about 2½ miles north-westward of Madalonot point. Darajuay (Darahuay) islands lie about 1½ miles south-south-westward of Catbalogan (Katbalogan). Between them and the coast of Samar, there is a channel about half a mile wide, with a least depth of 3½ fathoms ($6^{m}4$) in the fairway, which affords a fairly sheltered anchorage. Darajuay (*Lat. 11° 45′ N., Long. 124° 53′ E.*), the southern and larger island, is 312 feet ($95^{m}1$) high; it is covered with grass and has a few scattered palms; the north-eastern side is partly wooded. There is a small sand spit on the northern side, otherwise the coast is bordered by a rocky ledge. Little Darajuay (Darahuay) is 168 feet ($51^{m}2$) high, and wooded.

Waray Bancoa reef, partly awash, lies about 3½ cables north-westward of Little Darajuay island. Its northern edge is marked by a red conical buoy.

Lutao reefs, situated westward of Catbalogan, are three dangerous reefs, which dry, the western one being covered only at extremely high tides. A red conical buoy is moored off the north-western extremity of the reefs, and a can buoy painted in red and black horizontal bands, marks the eastern edge.

Quinutay (Kwinutay) reef, partly awash, lies with its outer end about 7 cables westward of Aguada point, situated three-quarters of a mile southward of Catbalogan light-structure. A red conical buoy marks the western edge of the reef. There is a channel, with a depth of 1½ fathoms ($2^{m}7$), between this reef and the reef extending from Aguada point.

A light is exhibited, at an elevation of 100 feet ($30^{m}5$), from a white concrete pillar, situated on a hill on the northern side of the entrance to Catbalogan (Katbalogan) river.

Anchorage.—Directions.—Anchorage may be obtained anywhere off the town according to draught. In bad weather vessels may obtain a more secure anchorage between the Darajuay islands and the coast of Samar, in depths of from 4 to 6 fathoms ($7^{m}3$ to $11^{m}0$).

A vessel may approach the anchorage off Catbalogan by North or South channels, which lead on either side of Lutao reefs or by the channel between the Darajuay islands and the coast of Samar. In North channel there is a least depth of 4 fathoms ($7^{m}3$) over a small patch of sand, in the middle. A vessel using this channel should pass between this patch and the red conical buoy marking the north-western end of Lutao reefs.

To approach by South channel, the vessel should bring Catbalogan light-structure to bear 063° before the larger Cagdullon (chart 3823) island bears less than 316°. Steering for the light-structure on this bearing the vessel should pass midway between the black and red buoy

Charts 3808, 943, 1263.

Chart 1622, plan of Katbalogan anchorage.

marking the eastern end of Lutao reefs, and the red buoy marking the western end of Quinutay reef.

To approach by the channel eastward of the Darajuay islands, the vessel should pass about a quarter of a mile eastward of them and steer 322°, until the light-structure bears 052°, when she should steer for it on that bearing and anchor as desired.

Catbalogan.—Catbalogan, the capital of the province of Samar, stands on the shore of a small bay on the southern side of the mouth of Catbalogan river. It is small, of little commercial importance, and has few resources. There is a hospital in the town.

There is a pier, with a least depth of 11 feet ($3^{m}4$) alongside.

The town is connected to the general telegraph system.

Storm signals.—Storm signals are shown from a mast on the pier. *See* page 11.

Radio station.—There is a radio station at Catbalogan. *See* page 14.

Chart 3823.

Coast.—Dangers.—Light.—Buri island, about 2¾ miles north-westward of Catbalogan, is separated from the coast of Samar by a narrow channel which nearly dries. It is covered with grass and palms, and has several small hills, the highest of which has an elevation of 243 feet ($74^{m}1$).

Silanga bay, between the eastern side of Buri island (*Lat. 11° 48′ N., Long. 124° 50′ E.*) and Samar, affords excellent anchorage, in depths of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$), mud, sheltered from all except southerly winds. By keeping about one cable from the eastern side of Buri, small craft can proceed farther northward and find good shelter from all winds, in a depth of 2½ fathoms ($4^{m}6$), mud. Masasungiao islet, 98 feet ($29^{m}9$) high, lies close off the north-western extremity of Buri island.

Cagdullon (Kagdullon) islands are two small wooded islands lying about 1¼ miles westward of the southern end of Buri island. The western island is 90 feet ($27^{m}4$) high and the eastern 122 feet ($37^{m}2$). The channel between them and Marisan reef is half a mile wide, with a depth of 11 fathoms ($20^{m}1$).

Marisan and Candongos reefs, which dry, lie in the channel between the southern part of Buri island and the Cagdullon islands.

Between Catbalogan and Calbayog, about 24 miles north-westward, the coast is indented by many bays, which are shallow and exposed to south-westerly winds. Sheltered anchorage may be obtained by small vessels at the head of Cambatutay (Kambatutai) bay, which is entered about 8 miles north-westward of Catbalogan. In fair weather, anchorage may be obtained anywhere along this coast. There are several towns along this coast, of which Tarangnan, situated close within Tarangnan point, the north-western entrance point of Cambatutay bay, and Santa Margarita, about 9½ miles farther north-westward, are the most important.

Tagdaranao islets, 190 and 268 feet ($57^{m}9$ and $81^{m}7$) high, are two islets about half a mile apart, the southern of which lies about three-quarters of a mile westward of Tarangnan point, with shallow water between them and the point.

The coast for about 13 miles north-westward of Tarangnan point is low and intersected by small streams.

Charts 3808, 943, 1263.

Chart 3823.

Napalisan island, 161 feet ($49^{m}1$) high, lies on the western edge of the bank extending north-westward from Palanas point, situated 5½ miles north-north-westward of Tarangnan point, and is a good mark for vessels making the entrance to Gandara river.

Gandara river, the principal river on the western coast of Samar, discharges about half a mile north-eastward of Palanas point. At high water, craft of less than 90 feet ($27^{m}4$) in length and a draught of 6 feet ($1^{m}8$) can ascend as far as the fork just above the town of Gandara, about 8 miles from the entrance. Smaller craft can ascend to Peña Plata and San Miguel, situated on the northern and southern branches, respectively. The currents in the river are generally weak. Local fishermen can usually be obtained as pilots.

A light is exhibited, at an elevation of 34 feet ($10^{m}4$), from a white concrete tower, on the northern extremity of Caprangasan (Kaprangasan) island (*Lat. 11° 59′ N., Long. 124° 41′ E.*), situated on the southern side of the entrance to the Gandara river.

The lower end of Sondara river, which discharges about 1¾ miles northward of Palanas point, is an excellent harbour for small craft; otherwise it is of little importance, its branches being narrow and tortuous.

Calbayog.—The town of Calbayog (Kalbayog) is situated on the eastern side of the entrance to the river of the same name, and is the largest town and principal port for the export of hemp in the island. A wooden wharf, which extends south-south-westward from the town, and the red dome of the church are prominent. In 1938, there was a depth of 4 feet ($1^{m}2$) on the bar, and shoal water extends for some distance offshore in front of the town.

Calbayog is connected to the general telegraph system.

Anchorage.—The best anchorage is in a depth of 7 fathoms ($12^{m}8$), about one mile offshore, southward of the town.

Canahauan islands. — Dangers. — Canahauan (Kanahauan) islands are a group of two large and several smaller islands, lying west-north-westward of Catbalogan and from 3¼ to 6½ miles from the coast of Samar. They afford good anchorages among them, sheltered from all winds, that of Port Aguirre being an excellent refuge during typhoon weather. As these islands lie about 11 miles from Catbalogan and 15 miles from Calbayog, both of which are on an open coast, this anchorage offers a safe refuge for both.

The highest point of the group is at the north-eastern extremity of Canahauan Daco (Kanahauan Dako) island, which has an elevation of 575 feet ($175^{m}3$). Timpasan, the other large island of the group, is 410 feet ($125^{m}0$) high near its southern end.

The principal dangers of the group are :—Bolo rock, awash, about 3½ cables northward of Cambaloi (Kambaloi) islet, which is 107 feet ($32^{m}0$) high, at the south-eastern end of the group, with a sunken rock about midway between them. A shoal, with a depth of 25 feet ($7^{m}6$) over it, about 6 cables westward of the southern extremity of Boloang island, 305 feet ($93^{m}0$) high, and the easternmost of the group. A sunken rock about a quarter of a cable westward of the southern extremity of Balading island, which is 208 feet ($63^{m}4$) high, Borobaloto rock, 2 feet ($0^{m}6$) high, the westernmost danger of the group. Two rocks, awash, about a quarter of a mile westward and north-westward, respectively, of Canmamot (Kanmamot) island, 126 feet ($38^{m}4$) high,

Charts 3808, 943, 1263.

and the north-easternmost of the group. Cambidsos (Kambidsos) rocks, two rocks, 93 and 36 feet (28^m3 and 11^m0) high, respectively, 1¼ miles north-westward of Canmamot island, and a rock, awash, close eastward of the north-eastern rock. A shoal, with a depth of 21 feet (6^m4) over it, about midway between the north-western extremity of Canahauan Daco island and Tangad island, 150 feet (45^m7) high, half a mile west-north-westward. Dapdap rocks, 2 feet (0^m6) high, the northernmost danger, about 1¾ miles north-westward of the north-western extremity of Canahauan Daco island. Except for the above-mentioned dangers the passages between the islands of the group are deep.

Anchorages.—Directions.—The best anchorage is in Port Aguirre between the north-eastern side of Timpasan island and the south-western end of Canahauan Daco island, in depths of from 9 to 11 fathoms (16^m5 to 20^m1). Vessels should approach it from eastward, passing northward of Poro islet (*Lat. 11° 49′ N., Long. 124° 42′ E.*), situated about 4 cables southward of Canahauan Daco island, and westward of two islets lying close southward of the same island. This anchorage may also be approached by vessels with a draught not exceeding 10 feet (3^m0), from the northward between the two large islands.

Protected anchorage may be obtained between the south-eastern end of Timpasan island and Batgongon island, 262 feet (79^m9) high, eastward of it, and for deep draught vessels in the area northward and eastward of Poro islet, in depths of from 15 to 16 fathoms (27^m4 to 29^m3).

Libucan islands.—Dangers.—Libucan (Libukan) islands are a group of three islands and several islets lying about 3½ miles north-north-westward of Canahauan islands, and the same distance from the coast of Samar. The channel between Canahauan and Libucan islands and the coast is about 2 miles wide in the narrowest part, and is moderately deep and free from dangers.

Libucan (Libukan) island, the largest of the group, is 528 feet (160^m9) high. Good anchorage may be obtained in a bay on the northern side of the island, in depths of from 12 to 14 fathoms (21^m9 to 25^m6), soft mud. Coasting vessels make for this anchorage when the south-westerly gales called " collas " begin to blow.

Laylaya islets are two rocky islets, 90 and 23 feet (27^m4 and 7^m0) high, connected by a reef which dries, lying about one mile south-eastward of Libucan island.

Lunod rock, awash, lies 8½ cables south-westward of the southern extremity of Libucan island.

Kawayan, Moroporo, and Nagsanga are three rocky islets, 61, 61, and 68 feet (18^m6, 18^m6 and 20^m7) high, respectively, lying about half a mile south-westward of Libucan island.

Tangad Libucan (Libukan), 269 feet (82^m0) high, and Libucan Gutiay (Libukan Gutiai), 371 feet (113^m1) high, are two islands lying, respectively, three-quarters of a mile north-westward and a quarter of a mile westward of the north-western end of Libucan island.

Uray (Urai) Vanoa rocks, 2 feet (0^m6) high, lie three-quarters of a mile south-south-westward of Libucan Gutiay island.

Coast.—Between Calbayog and Jibatan (Hibatan) point, 4¾ miles westward, the coastal bank, with depths of less than 3 fathoms (5^m5)

Chart 3823.

over it, extends as much as one mile offshore, at the mouth of Jibatan (Hibatan) river, and is steep-to at its edge. This river, which discharges about 3¼ miles westward of Calbayog, has a depth of only one foot ($0^{m}3$) on its bar, and from one to 2 fathoms ($1^{m}8$ to $3^{m}7$) inside. Trinidad village is situated on the eastern side about one mile from the entrance.

Between Jibatan point and Balicuatro point (chart 3370), the north-western extremity of Samar, the coast is bold and fairly clear of dangers; from Jibatan point to Malayoc (Malayok) point, about 10 miles north-westward, the coast is high.

Damita rock, 27 feet ($8^{m}2$) high, lies on the edge of the coastal bank about 1½ miles north-westward of Jibatan point and 5½ cables offshore. Daraga islet, 118 feet ($36^{m}0$) high, lies about 1½ miles north-westward of Damita rock, and is connected to the coast of Samar by a reef.

A reef lies about a quarter of a mile westward of Binalio point, situated about 5 miles north-westward of Jibatan point, and Binalio islet, 115 feet ($35^{m}0$) high, lies about 4 cables south-westward of the point.

Chart 3370.

Between Malayoc point (*Lat. 12° 12′ N., Long. 124° 23′ E.*) and Maglagabon point, about 6½ miles north-north-westward, the coast is steep-to, thence to Sojoton (Sohoton) point, 1½ miles north-north-westward, it is rocky. Sojoton point is high, and has an islet of the same name, 105 feet ($32^{m}0$) high, lying a quarter of a cable north-westward of it. Close northward of the point is a small cove with steep sides, and a depth of 4 fathoms ($7^{m}3$) near the mouth of Palanit river which discharges into its head.

The coast northward is described on page 423.

Chart 3823.

SAMAR SEA.—The Samar sea is bounded on the north by the south-eastern end of Luzon; on the west by the islands of Ticao and Masbate; on the south by the northern end of Leyte; and on the east by the western side of Samar.

Islands and dangers.—Light.—The group of five islands, lying in the Samar sea between the southern part of Masbate and the west coast of Samar, consists of Maripipi at the south, Tagapula at the north, with Almagro between them, and eastward of the latter are Santa Niño and Camandag. There are also several smaller islands described below; they are all high and steep-to. The tidal streams in the channels are strong.

Maripipi island, 5 miles northward of Buhoc point, Biliran island (page 411), is 3,020 feet ($920^{m}5$) high near the centre, and wooded. Sambauan islets are four rocky islets, the highest of which has an elevation of 130 feet ($39^{m}6$), surrounded by a shoal of sand, lying about 1½ miles south-westward of the western extremity of Maripipi island. Buga rock, 8 feet ($2^{m}4$) high, lies 1¼ miles westward of the same point. A rock, awash, lies about 2 cables north-eastward of Buga rock.

Almagro island, about 5 miles northward of Maripipi island, has a flat summit, 1,824 feet ($555^{m}9$) high in the southern part. The town of Almagro is situated at the head of the cove of the same name in the south-western part of the island.

Charts 3808, 943, 1263.

Chart 3823.

Cabilison (Kabilison) island lies about half a mile southward of Tinta point, the south-western extremity of Almagro island.

A light is exhibited, at an elevation of 282 feet (85^{m}9), from a circular steel tower, on the summit of Cabilison island.

Karikiki island, 668 feet (203^{m}6) high, lies about 1¼ miles eastward of the north-eastern end of Almagro island, and between them are Little Karikiki and Sayan islets, 221 and 75 feet (67^{m}4 and 22^{m}9) high, respectively, with deep passages between them.

Santo Niño island, 5 miles east-south-eastward of Almagro island, is 1,550 feet (472^{m}4) high. Santo Niño harbour, on the northern side of the island, is an excellent typhoon refuge for vessels not exceeding 150 feet (45^{m}7) in length. Its entrance is about 60 feet (18^{m}3) wide, with a depth of 1¾ fathoms (3^{m}2), leading into a circular basin one cable in diameter. A rock, with a depth of 2 feet (0^{m}6) over it, lies on the western side of the channel, close eastward of some rocks, some of which dry and others are awash. The shingle spit on the eastern side of the channel is covered at high water, but the edge is easily visible and should be passed close-to, steering to make good 158°, which leads to an anchorage, in a depth of 5¾ fathoms (10^{m}5), mud, about the centre of the basin. The town of Santo Niño is situated on the western shore of the harbour, near its head.

A rock, 53 feet (16^{m}2) high, lies about 2 cables westward of Magabook point, the western extremity of Santo Niño island, to which it is connected by shoal water. A rock, 10 feet (3^{m}0) high, lies close off the eastern side of the island, about 1¾ miles south-eastward of Santo Niño harbour.

Pilar islet (*Lat. 11° 56′ N., Long. 124° 24′ E.*), 145 feet (44^{m}2) high, lies one mile north-westward of Cambia (Kambia) point, the north-western extremity of Santo Niño island. It is steep-to except on the eastern side, from which a reef projects a short distance.

Camandag (Kamandag) island, 1¾ miles north-north-westward of Santo Niño island, is 1,408 feet (429^{m}1) high.

Tagapula island, about 7½ miles north-westward of Almagro island, is 1,470 feet (448^{m}1) high. A shoal, with a depth of 7 fathoms (12^{m}8) over it, and steep-to, lies half a mile off the south-western coast of Tagapula island. Sibugay (Sibugai) island, 428 feet (130^{m}4) high, lies about 6½ cables off the middle of the northern coast of Tagapula island, with a deep channel between.

España shoal, with a least depth of 2 fathoms (3^{m}7) over it, and steep-to, lies about three-quarters of a mile eastward of Balalaki point, the north-eastern extremity of Tagapula island. Pantalan islet, 123 feet (37^{m}5) high, lies close westward of Balalaki point.

Chart 3370.

SAN BERNARDINO STRAIT.—San Bernardino strait, which separates the south-eastern extremity of Luzon from the north-western part of Samar, is an important passage, as it is one of the routes taken by vessels from the Pacific bound to Manila or Cebu. The strait is wide, deep, and free from dangers in the fairway. Heavy seas and tide-rips are encountered here during the North-east monsoon.

Tidal streams.—The tidal streams in San Bernardino strait attain a rate of from 4 to 8 knots in the narrow passages between the islands,

Charts 3818, 3808, 943, 1263.

Chart 3370.

and cause strong eddies and whirlpools among them. After passing through the strait the streams spread out on either side and lose their force.

There are two south-west-going streams of apparently equal strength during the day which have a maximum rate of about 5½ knots at springs and 2¾ knots at neaps. These streams attain their maximum rates at about 2 hrs. 30 min. after high water at Yokohama. Between these two south-west-going streams, the stream usually continues to flow in the same direction, reaching a minimum rate about midway between the two occurrences of maximum rate, but, for three to six days following the moon crossing the equator, it changes direction to north-east and may reach a maximum rate of about 3 knots in that direction.

The main north-east-going stream commences to flow about 35 minutes before the lower of the two low waters at Yokohama, and reaches its maximum rate, of 5½ to 7½ knots at springs, or 2 to 3 knots at neaps, at about 2 hrs. 50 min. after the lower low water at Yokohama. It turns again to south-west at about 6 hours after the lower low water at Yokohama.

Naranjo pass.—Dangers.—Light.—Naranjo pass, the westernmost of the three channels leading into San Bernardino strait from southward, lies between the Naranjo islands on the west and Capul (Kapul) island on the east; it is deep and has a least width of about 5 miles.

Destacado island, 662 feet ($201^{m}8$) high, lies in the southern approach to Naranjo pass, 13¾ miles westward of Maglagabon point (page 420). It is clear of dangers except for a reef on which there is a rock, 9 feet ($2^{m}7$) high; this reef extends about 3 cables offshore in Lode bay on the western side of the island. The anchorage in this bay is good except in south-westerly weather.

Naranjo islands, lying about 7½ miles southward of the coast of Luzon, comprises six islands, Aguada, Darsena, Escarpada, Rasa, Medio, and San Andres. Their slopes are very abrupt, being steeper near the coasts. The islands are almost bare of heavy timber, though covered with brushwood and jungle. There are no important towns in the group. The best anchorage is in Sabariog bay, on the northern side of Darsena island. During north-easterly weather anchorage may be obtained on the south-western side of Escarpada island. Ternate bay, between Aguada and Darsena islands, affords good anchorage, but at times the tidal streams in it are strong.

The south-west-going stream in San Bernardino strait generally sets south-westward between and around Naranjo islands, but in the channel between Aguada and Escarpada islands it sets north-westward, and between Rasa and San Andres islands (*Lat. 12° 24′ N., Long. 124° 01′ E.*) north-eastward, causing heavy tide-rips where it meets the south-west-going stream.

Capul (Kapul) island has several sharp cone-shaped summits, but the highest point of the island, near the south-eastern end, is 710 feet ($216^{m}4$) high and flat-topped. The slopes are steep and heavily wooded except on the north-eastern side where a valley trends inland and there are several clearings. Capul (Kapul), on the eastern side of the island, is the principal town; it contains a church with a prominent tower. Anchorage may be obtained during fair weather north-east-

Charts 3818, 3808, 943, 1263.

Chart 3370.

ward of the town, but this coast is exposed to the full strength of the tidal streams which set through Capul (Kapul) pass. San Luis, at the head of San Luis bay, on the eastern side of the island at the northern end, is a fishing village.

Tide-rips extend for over one mile northward of Totoog point, the northern extremity of Capul island. During the south-west-going stream in San Bernardino strait, a north-going stream sets along the eastern side of Totoog point.

A light is exhibited, at an elevation of 143 feet ($43^{m}6$), from a white circular masonry tower, over a dwelling on Totoog point.

Rubi shoal, of sharp black rocks, with a depth of 19 feet ($5^{m}8$) over it, lies about 1¾ miles southward of Timon point, the southern extremity of Capul island.

Diamante rock (*Lat. 12° 21′ N., Long. 124° 12′ E.*), about 2¼ miles south-south-eastward of Timon point, is composed of sharp black rocks which nearly dry. Both this danger and Rubi shoal are steep-to and difficult to distinguish, and strong eddies are encountered between them.

Capul pass.—Capul pass, between Capul island and Dalupiri island, should be avoided if possible, especially by vessels bound northward, as there is danger of being set on to Diamante rock. While the tidal stream sets southward on the western side and in the middle of the pass, there is a north-going stream setting along the western side of Dalupiri island, causing a long line of tide-rips and eddies which gradually work across the pass according to the stage of the tide. The ebb flows north in the entire pass, coming from westward over Rubi shoal, while the flood is still running south-eastward of Diamante rock.

Dalupiri island is 421 feet ($128^{m}3$) high, and partly wooded. There is some heavy timber near the northern part, but the island is being cultivated more each year. Both the eastern and western sides of the island are clear of dangers and steep-to, but from the northern end a bank, with depths of less than 6 fathoms ($11^{m}0$) over it, and a least depth of 27 feet ($8^{m}2$) near its outer end, extends 2¼ miles northward from Igang point, the northern extremity, and from the southern end of the island a bank, with depths of less than 10 fathoms ($18^{m}3$) over it, extends about 2¼ miles south-south-eastward and 2 miles south-eastward from Minanga point, the southern extremity. At the inner end of this bank, depths of less than 3 fathoms ($5^{m}5$) extend about 6 cables offshore and depths of less than 6 fathoms ($11^{m}0$) extend 1½ miles. Anchorage may be obtained anywhere off the coast, but necessarily close in on account of the considerable depths, except on the banks extending from the northern and southern end of the island.

Dalupiri pass.—Dalupiri pass, between Dalupiri island and the western coast of Samar, is the safest of the three passages leading into San Bernardino strait from southward. The tidal streams generally set fair through the passage, with an eddy close inshore. Tide-rips and whirlpools are encountered about 2 miles northward of Igang point, and 1½ miles south-eastward of Minanga point. The pass has a least width of about 1¾ miles and is clear of dangers in the fairway.

Canaguayan (Kanaguayan) islet, 120 feet ($36^{m}6$) high, lies close off the coast of Samar, on the eastern side of the entrance to Dalupiri pass.

Charts 3818, 3823, 3808, 943, 1263.

Chart 3370.

Looc (Look) bay is about 6 cables wide at its entrance between Canaguayan islet and Looc (Look) point, northward of it. There is a shoal, with a depth of 27 feet (8m2) over it, in the middle of the entrance, and a bank extends about half a mile westward from Looc point. The head of the bay is filled with reefs. Vessels may obtain sheltered anchorage between Canaguayan islet and the coast of Samar with good holding ground, but the space is limited.

Between Looc point (*Lat. 12° 23′ N., Long. 124° 20′ E.*) and the entrance to Mauo river, about 4¼ miles north-north-westward, the coast consists of sand and rock, covered with mangroves to the water's edge. This part of the coast is the base of a range of mountains covered with dark green trees.

Mauo river has a rocky entrance, the channel lying close to the wooded bluff on the northern side. The available width of the channel is reduced to about 60 feet (18m3) by a reef extending from the southern entrance point, and the depth is 2½ fathoms (4m6) ; close inside, a spit, with a depth of 6 feet (1m8) over it, projects from the village on the northern bank. A sharp turn southward as soon as the bow is inside the reef, is necessary to clear it. Above the reef there are depths of from 3 to 5 fathoms (5m5 to 9m1), but only 2½ fathoms (4m6) can be counted on a quarter of a cable above. This is a snug anchorage for vessels not exceeding 9 feet (2m7) draught and 140 feet (42m7) in length, but in protracted storms with much rain, stumps and large trees may be expected from up-river.

The anchorage outside is with the river well open ; depths of less than 20 fathoms (36m6) should be approached carefully. The ground is foul both northward and southward of the mouth of the river.

Between the mouth of Mauo river and Burobodiongan point, about 2 miles north-westward, the coast is bordered with rocks. Burobodiongan point is covered with high trees. The tidal streams, which attain a maximum rate of 7½ knots at springs, cause heavy tide-rips off this point.

Vessels may obtain anchorage off the town of Allen, 2 miles northward of Burobodiongan point, half a mile offshore, in a depth of 10 fathoms (18m3), sand and coral. It is not a good anchorage in bad weather.

Good anchorage may be obtained during the North-east monsoon in the open bay off Quinaguitman (Kinaguitman), about one mile northward of Allen ; in the northern part of the bay there are depths of from 13 to 27 fathoms (23m8 to 49m4).

Lipata point, about 2 miles north-north-westward of Allen, is rocky and bordered by a reef of sand and rock.

Light.—A light is exhibited, at an elevation of 37 feet (11m3), from a concrete tower, situated close northward of the entrance to Sabag river at Allen.

Directions.—At night or during stormy weather, vessels from southward bound through San Bernardino strait would do well to keep close to the Masbate coast and pass northward of the Naranjo islands.

Vessels bound southward through Naranjo pass, should pass about one mile westward of Totoog point and the same distance eastward of Destacado island. With the south-west-going stream running in San Bernardino strait vessels are likely to get set towards San Andres

Charts 3818, 3823, 3808, 943, 1263.

Chart 3370.

island Numerous swirls and eddies are formed in the channel between Capul island and Luzon.

Northern side of San Bernardino strait.—Coast.—Dangers.— Langao point (*Lat. 12° 32′ N., Long. 124° 03′ E.*), about 4¼ miles east-south-eastward of Tagiran point (page 394), is a sloping point, covered with tall grass, and is composed of a dark red conglomerate. There are several small inlets along this coast which afford some protection to small craft with local knowledge.

Hamorauan point, about one mile east-north-eastward of Langao point, is a bold reddish-brown bluff, about 70 feet ($21^{m}3$) high, with a steep wooded slope rising above it.

Off-lying dangers.—Light.—Calantas (Kalantas) rock, 5 feet ($1^{m}5$) high, lies 1½ miles southward of Colasi (Kolasi) point, situated about 1¼ miles eastward of Hamorauan point. A bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends nearly three-quarters of a mile south-south-eastward of the rock. An obstruction, with a depth of 3 feet ($0^{m}9$) over it, lies about 6 cables south-eastward of the rock. A bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends about 3½ cables westward of Calantas rock, and a 28-foot ($8^{m}5$) patch lies three-quarters of a mile north-westward of it.

A light is exhibited, at an elevation of 33 feet ($10^{m}1$), from a white concrete pillar, on Calantas rock.

Hamorauan reef, with a least depth of one fathom ($1^{m}8$) over it, lies about three-quarters of a mile west-south-westward of Colasi point.

Ticlin strait.—Ticlin (Tiklin) strait is the channel between the coast of Luzon and the islands of Calintaan (Kalintaan), Juac (Huak) and Ticlin (Tiklin). Although there are considerable depths in this channel it is not safe for large vessels on account of the strong tidal streams and eddies in it. There are especially strong sets between Colasi point and Burungan island, 6 cables north-eastward, and between Calayuan (Kalayuan) point, the southern extremity of Calintaan island, and Calantas rock. The western shore of the strait, between Colasi point and Padang point, about 4 miles north-north-eastward, is composed of broken coral covered with mangroves, and fringed by reefs which extend from half a cable to 3½ cables offshore. The least navigable width of the strait is about 1¾ cables between Calintaan and Burungan islands.

Calintaan island, 275 feet ($83^{m}8$) high, and Juac island, 144 feet ($43^{m}9$), are covered with trees and jungle; both have large lagoons and are fringed by mangrove. The inner shores are low and have coral beaches, the outer ones are alternately rocky bluffs and coral beaches; both islands are fringed by reefs. Apari rock, 10 feet ($3^{m}0$) high, lies on the south-eastern side of Calintaan island, about three-quarters of a mile north-eastward of Calayuan point, and one cable offshore.

Juac (Huak) channel, which separates Calintaan and Juac islands, is deep, but narrow.

Ticlin island, 184 feet ($56^{m}1$) high, and fringed by a reef, lies about one mile north-north-eastward of Juac island. A bank, with depths of less than 5 fathoms ($9^{m}1$) over it, extends about 9 cables south-south-westward from Ticlin island, and near its outer end is a rock, awash. Foul ground, with a rock, 6 feet ($1^{m}8$) high, at its outer

Charts 3818, 3808, 943, 1263.

Chart 3370.

edge, extends about a quarter of a mile eastward from the eastern point of the island, and shoal water extends about the same distance from the western side.

Magtimua rock (*Lat. 12° 34′ N., Long. 124° 08′ E.*), about 3 feet ($0^{m}9$) high, lies about 6 cables south-eastward of Ticlin island.

The passage between Juac and Ticlin islands is not safe.

Matnog bay, open eastward, lies on the western side of Ticlin strait. It is fringed by a narrow reef, and from the southern side of the entrance a rocky spit, with a rock, awash, at its outer end, extends about 3 cables northward. In the middle of the entrance there is a shoal, with depths of from 34 to 48 feet ($10^{m}4$ to $14^{m}6$) over it.

Small vessels may obtain anchorage in Matnog bay, in a depth of 3 fathoms ($5^{m}5$), about a quarter of a mile from the beach. They should enter the bay with the sharp conical hill on Ticlin island bearing 090°, astern. The white iron roof of the church in the town of Matnog is prominent. The tidal streams in Matnog bay are weak.

Directions.—A vessel approaching Ticlin strait from westward should steer for Calayuan point, bearing 090° until Calantas rock bears 170°, when she should steer for the summit of Ticlin island, bearing 040°, which will lead through the narrow part of the strait in mid-channel, but care should be taken to avoid a set westward when abreast of Burungan island if the north-going stream is running in the strait.

Charts 3370, 3818.

Coast.—Between Padang point and Bingay point, about 28 miles northward, there are several unimportant towns, but coasting vessels usually call only at Matnog and Gubat. The coast is fringed by reef, which, from being narrow as far northward as Tang point, about 11 miles northward of Padang point, gradually increases in width to the vicinity of Bingay (Bingai) point, where it extends from one to 1¾ miles offshore.

Balusingan bay, entered between Padang point and Pacahan (Pakahan) point, about 5 miles north-north-eastward, affords anchorage, in depths of from 10 to 15 fathoms ($18^{m}3$ to $27^{m}4$), sand, from half to three-quarters of a mile offshore, protected from westerly and south-westerly winds.

Chart 3818.

About 5½ miles westward of Tang point is Bulusan volcano, 5,115 feet ($1{,}559^{m}1$) high, and active. When not obscured by clouds it is an excellent mark. Sharp peak, about 1¼ miles north-eastward of Bulusan volcano, is 3,986 feet ($1{,}214^{m}9$) high; it appears sharp only from eastward.

Anchorage may be obtained, in depths of from 12 to 14 fathoms ($21^{m}9$ to $25^{m}6$), in a break in the coastal reef off Bulusan, about 1¾ miles southward of Tang point, with the church at Bulusan bearing 300°, and Tang point, 010°. The holding ground is not good, and there is a considerable tidal stream.

Chart 3475, plan of Port Gubat.

Between Tang point and Rasa point, about 7½ miles northward, the coast is fringed by a reef, extending from about a quarter to half a mile offshore. About 1¾ miles southward of Rasa point is the town of Barcelona, off which there is a break in the reef.

Port Gubat.—Light.—Beacon.—Port Gubat is formed by an

Charts 3818, 3808, 943, 1263.

Chart 3475, plan of Port Gubat.

opening in the coastal reef about a mile wide between Rasa point and Dancalan point, about 2 miles northward. The port consists of two bays, the southern of which is the larger, but it is never used as it is exposed to north-easterly winds and sea, and the holding ground is poor. The northern bay is well sheltered from the sea by reefs, but its northern part is shallow.

Canauay reef, which dries, extends about 8 cables south-south-eastward from Dancalan point. On the western side of the entrance to the northern bay is Penuntignan point, from which a reef extends about 2 cables eastward, prolonged by a bank, with a least depth of one foot ($0^{m}3$) over it, for about 1¼ cables. A 3-fathom ($5^{m}5$) patch lies in the entrance to the northern bay, about half a mile east-north-eastward of Penuntignan point.

A post, surmounted by a white triangular daymark, stands on the edge of the shore reef, about 4½ cables north-north-westward of Penuntignan point.

A light is exhibited, at an elevation of 37 feet ($11^{m}3$), from a white concrete pillar, about 6 cables north-north-westward of Penuntignan point (*Lat. 12° 55′ N., Long. 124° 07′ E.*).

The town of Gubat stands on the western shore of the northern bay, and Sabang river discharges into the head of the bay.

Anchorage.—Anchorage may be obtained, in depths of from 4 to 5 fathoms ($7^{m}3$ to $9^{m}1$), mud, with the beacon bearing 298°, distant 3 cables.

Chart 3818.

Coast.—Between Dancalan point and Montufar point, about 6 miles north-north-eastward, and thence to Bingay point, about 3 miles northward, the coast is fringed by a reef, which dries, with a break in it about 2½ miles northward of Dancalan point. This reef, which extends from about 6 cables to 1¾ miles offshore, is generally steep-to within a quarter of a mile of its edge, which is always well defined by heavy breakers.

Bingay (Bingai) islet, 15 feet ($4^{m}6$) high, lies near the edge of the coastal reef about 4 cables east-north-eastward of Bingay point. Shoal water extends about 1½ cables outside the edge of the reef.

A wreck, stated, in 1941, to be conspicuous, lies about 2 miles east-south-eastward of Bingay point.

For the description of Albay gulf, *see* pages 554-559.

Charts 3370, 3818.

San Bernardino islands.—Light.—Dangers.—San Bernardino islands, two in number, lie 8½ miles eastward of Bulusan on the coast of Luzon and in the northern entrance to San Bernardino strait. The southern and larger island is 160 feet ($48^{m}8$) high, and sparsely wooded. Two large rocks, the northern 17 feet ($5^{m}2$), and the southern 21 feet ($6^{m}4$) high, lie about 2 cables eastward of this island. The northern island is 100 feet ($30^{m}5$) high, very rugged, and bare of vegetation.

These islands lie on the south-western end of a bank, over which there are depths of less than 10 fathoms ($18^{m}3$), extending about 6 miles north-eastward and surrounded by much greater depths.

A light is exhibited, at an elevation of 215 feet ($65^{m}5$), from a white circular masonry tower, with a dwelling attached, on the southern of the San Bernardino islands.

A rock, with a depth of 26 feet ($7^{m}9$) over it, was reported in 1941 to

Charts 3808, 943, 1263.

Charts 3370, 3818.

lie about one mile north-north-westward of San Bernardino light-tower, and a 16-foot (4^m9) patch lies about 7 cables eastward of the same light-tower.

Chart 3370.

Southern side of San Bernardino strait.—Coast.—The island of Samar, the northern coast of which forms the southern side of San Bernardino strait, is moderately high, densely wooded and well watered. It is sparsely populated, and only a small part is cultivated. The principal export is hemp.

The northern coast of Samar is fronted by numerous islands, banks and shoals. The North-east monsoon, which blows at times with the force of a gale, is accompanied by much rain and a very heavy sea ; at this season of the year there is no safe anchorage between Port Palapag (page 434) and Biri channel (page 429) and it is frequently impossible to communicate with the towns of Catarman (Katarman) and Bobon (*Lat. 12° 32′ N., Long. 124° 34′ E.*).

Balicuatro point, the north-western extremity of Samar, is steep-to and clear of dangers, the reef which fringes it on both sides extending only a short distance offshore. The land within rises to a hill, 570 feet (173^m7) high, about 1¼ miles south-south-eastward of the point, and is heavily wooded. For about 2½ miles south-eastward of Balicuatro point the coast is high and densely wooded, the points are rocky, and in most of the bights there are beaches. Coconut island, lying close offshore about 2½ miles south-eastward of Balicuatro point, is low and covered with coconut trees. The passage between the island and the coast of Samar should only be used by boats with local knowledge at slack water.

A reef extends about 4 cables north-westward from Coconut island, and a 15-foot (4^m6) patch lies about 4½ cables westward of the northern extremity of the island. A rock, awash, lies about 3 cables east-south-eastward of the southern extremity of the island.

Lavezares harbour, entered about half a mile south-eastward of Coconut island, is nearly filled by the fringing reefs which extend from either shore, but there is a narrow channel between them leading to the town of Lavezares at the head. A detached reef, which dries, lies about half a mile northward of the eastern entrance point of the harbour. Fish traps mark the edges of the reefs during most of the year.

Anchorage may be obtained by deep draught vessels with local knowledge in the entrance to Lavezares harbour, with the municipal building, the largest building in the town, bearing 181°, and the reef northward of the eastern entrance point, 091°. Small craft with local knowledge may obtain anchorage, in depths of from 2 to 3 fathoms (3^m7 to 5^m5), protected from westerly winds nearer the head of the harbour on the same bearing of the municipal building ; the swinging room is limited, but the holding ground is good. The edges of the reefs are sometimes marked by two stakes and small craft should anchor outside them. This anchorage is bad during northerly and north-easterly gales, or when a swell sets into the harbour.

Urdaneta harbour, entered about half a mile eastward of Lavezares harbour, is clear of dangers in the fairway, but a bank, with depths of less than 5 fathoms (9^m1) over it, extends about half a mile north-westward from the eastern side of the entrance, and there is a coral

Charts 3808, 943, 1263.

Chart 3370.

reef, with a depth of 10 feet (3^{m}0) over it, lying within about 2 cables of the head. Anchorage may be obtained by vessels with local knowledge in Urdaneta harbour, in a depth of 10 fathoms (18^{m}3), except during northerly winds.

Off-lying islands and dangers.—Balicuatro islands, lying about 6 miles north-eastward of Balicuatro point (*Lat. 12° 35′ N., Long. 124° 17′ E.*), consist of Biri island, the largest and northernmost, Macarite (Makarite) and Cagnipa (Kagnipa) islands, separated from its south-western side by a narrow channel, and Talisay (Talisai), Magesang, Makadlao, and Tinau islands lying on the same extensive reef, which mostly dries, eastward and south-eastward of Biri; there are also numerous islets and rocks.

Biri island, 280 feet (85^{m}3) high, lies with Biri head, the north-western extremity, 8 miles north-north-eastward of Balicuatro point. Biri head is a rocky perpendicular bluff, 200 feet (61^{m}0) high, and steep-to, and is a prominent landmark when approaching San Bernardino strait from north-eastward. About a quarter of a mile eastward of Biri head a steep-to coral reef begins, which continues along the north-eastern and eastern sides of the island, and also surrounds all the islands lying eastward and south-eastward of Biri island. On the outer edge of this reef, which dries, are a series of islets of limestone formation, from 10 to 120 feet (3^{m}0 to 36^{m}6) high, which are distinctive features in this locality. With the exception of the two ends of the island and these outlying islets on the north-eastern and eastern sides, the coasts are low and fringed with mangroves. The western side is bordered mostly by a low bluff and gravel beach. The interior of the island is densely wooded. Most of the inhabitants live on the western side of the island.

A rock, 20 feet (6^{m}1) high, lies about 6 cables east-north-eastward of Biri head.

A shoal, with a depth of 34 feet (10^{m}4) over it, lies about 1¼ miles north-westward of Biri head, and a 37-foot (11^{m}3) patch lies 6½ cables west-north-westward of the head. A rock, 15 feet (4^{m}6) high, lies near the southern end of a reef, about three-quarters of a mile southward of Biri head, and 4 cables offshore. A bank, with a least depth of 8 fathoms (14^{m}6) over it, lies about 3½ miles south-westward of the head.

Anchorages.—Directions.—Protected anchorage may be obtained by vessels with local knowledge, in a depth of about 20 fathoms (36^{m}6), between the northern end of Cagnipa island and the eastern side of Macarite island, but it is not recommended, the bottom being rocky, and the tidal stream strong.

A small, but well protected anchorage may be obtained by vessels with local knowledge between the southern end of Biri island and Makadlao island. To approach it from Biri channel, a vessel should steer northward and pass about a quarter of a mile westward of a small bright sand cay lying about three-quarters of a mile west-south-westward of the western extremity of Makadlao island and anchor between the reefs, in depths of from 15 to 20 fathoms (27^{m}4 to 36^{m}6). The edges of the reefs marking this anchorage show plainly, are steep-to, and in many places are marked by fish traps.

Biri and Bani channels.—Dangers.—Biri channel, between Balicuatro islands and those lying close off the north coast of Samar,

Charts 3818, 3808, 943, 1263.

Chart 3370.

is generally used by coasting vessels bound from westward to the northern and eastern coasts of Samar. The tidal streams set eastward and westward in the channel, and run at a considerable rate.

On the southern side of Biri channel is another group of five densely wooded islands, which are so closely joined together by reefs as to appear to be practically one island. They are San Juan, Elonbachid, Nagnasa, Maravilla, and Bani; the first four are separated only at high water. The outer coasts are well defined, usually bold, and fringed by a narrow coral reef; the inner coasts are largely mangrove swamps.

A shoal, with a depth of 34 feet ($10^{m}4$) over it, lies about three-quarters of a mile north-westward of the southern extremity of Maravilla island (*Lat. 12° 37′ N., Long. 124° 21′ E.*), and between it and the western coast of that island there is a 28-foot ($8^{m}5$) patch. A shoal, with a depth of 31 feet ($9^{m}4$) over it, lies about three-quarters of a mile westward of the north-western extremity of Bani island. Three shoals, with least depths of 9, 7 and 13 feet ($2^{m}7$, $2^{m}1$ and $4^{m}0$) over them, respectively, lie from 4 to 6 cables from the western side of Bani island.

Bani channel, separating Bani island from the coast of Samar, has a least width of about 4 cables, but the navigable width with depths of over 3 fathoms is contracted to a width of about 2 cables by shoals extending from either side. Vessels should keep in mid-channel.

Anchorage.—Anchorage may be obtained by small vessels with local knowledge in the channel between San Juan and Bani islands, about 1½ miles from the western entrance. There is limited swinging room, but good holding ground of mud and sand, and the tidal streams at the anchorage are not much felt, although at the entrances to the channel they are strong. Vessels should enter from westward at slack water or with the west-going stream. This anchorage may be used as a typhoon shelter.

Charts 3370, 3808.

Off-lying dangers and banks.—Fitzgerald banks are three banks, with depths of 54, 37, and 37 feet ($16^{m}5$, $11^{m}3$, and $11^{m}3$) over them, lying respectively, 3¼, 5, and 8¼ miles east-north-eastward of the north-eastern extremity of Talisay island. These banks, clearly indicated by their colour, are of coral formation.

A 10-fathom ($18^{m}3$) and a 7½-fathom ($13^{m}7$) patch lie about 3¼ and 4 miles, respectively, eastward of the 37-foot ($11^{m}3$) patch of Fitzgerald banks. Two 8-fathom ($14^{m}6$) patches lie about 2 miles northward and 5 miles north-eastward, respectively, of the 37-foot ($11^{m}3$) patch of Fitzgerald banks.

Chart 3370.

NORTHERN SIDE OF SAMAR.—Coast.—Light.—The coast of Samar from southward of Coconut island to the village of Carangian (Karanian), 10 miles eastward, is low and fringed with mangroves, except at Cave point, about 4 miles eastward of Coconut island, where it is 190 feet ($57^{m}9$) high.

Gilbert island, 226 feet ($68^{m}9$) high at its southern end, is separated from the coast of Samar by a narrow channel, in which a depth of 4 fathoms ($7^{m}3$) can be carried by vessels with local knowledge; it is marked by beacons privately maintained. A detached coral reef lies in the middle of the western entrance, but the eastern entrance is clear of dangers. Sinamangan river which discharges into the southern side of this channel, is narrow and winding, and is navigable by boats nearly to the village of Enriqueta, about 1½ miles from its mouth. Baird point, the northern extremity of Gilbert island, is steep-to.

Cabaun (Kabaun) island, about 2 miles eastward of Gilbert island, is low, bordered with mangroves, and fringed by a reef, which extends about half a mile from the eastern side. A shoal, with a least depth of 22 feet ($6^{m}7$) over it, lies about one mile north-eastward of the south-eastern extremity of the island.

Green islet (*Lat. 12° 33′ N., Long. 124° 28′ E.*), about 100 feet ($30^{m}5$) high, lies between Gilbert and Cabaun islands, and about half a mile off the coast of Samar. It is fringed by a reef, and between it and Cabaun island, and south-eastward of it there is foul ground.

Ugamut island is a low island covered with mangroves, lying close to the south-western side of Cabaun island, from which it is separated by a narrow, impracticable channel. Foot islet, between Ugamut island and the coast of Samar south-westward of it, is about 10 feet ($3^{m}0$) high, and fringed by a reef. Bat islet, low, and fringed by a reef, lies between the southern end of Cabaun island and the coast of Samar; foul ground extends nearly one mile eastward from Bat islet.

Carangian (Karanian) channel is the narrow passage south-westward of Green and Foot islets and northward of Bat islet. The part south-eastward of Foot islet has irregular depths, the least being 4 fathoms ($7^{m}3$) in the fairway. Between Bat islet and the southern end of Cabaun island, the channel is over a quarter of a mile wide, deep and free from danger in the fairway. The channel is contracted by reefs extending from the islands and the coast of Samar. All the channels in this vicinity are subject to strong and irregular tidal streams.

Carangian village is situated on the eastern side of a small cove southward of Foot islet. The cove is encumbered with reefs, but there is a narrow boat channel through them to the shore. There is steamer communication with other coastal ports. A range of hills approaches the coast close eastward of the village, which is the only high land in the vicinity. Carangian may be identified by a red warehouse and jetty inside the entrance of the cove, and a white warehouse and pier a little farther in.

A light is exhibited from the head of the pier situated about 4 cables north-eastward of Carangian.

From the bay southward of Bat islet to Bobon point, about 3¼ miles eastward, the coast is low and bordered by a sandy beach, extending from which is the usual coral reef.

A rock, 10 feet ($3^{m}0$) high, lies at the western end of a shoal, which dries, about 1½ miles westward of Bobon point, and 4 cables offshore. About half a mile westward of this rock is a shoal with a depth of 10 feet ($3^{m}0$) over it. A rock, which dries, lies about three-quarters of a mile westward of Bobon point and about 3½ cables offshore.

The town of Bobon is situated on the eastern side of the entrance to Bobon river, which discharges close westward of Bobon point. Reefs extend from both entrance points of the river, leaving a narrow boat channel to the beach in front of the town.

The usual anchorage in fine weather is in a depth of from 6 to

Chart 3370.

8 fathoms ($11^{m}0$ to $14^{m}6$), with the church at Bobon bearing 120°, distant three-quarters of a mile.

Off-lying shoals.—A shoal, with a depth of 39 feet ($11^{m}9$) over it, lies about 1¾ miles north-north-eastward of the northern extremity of Cabaun island.

Fisher shoal, with a least depth of 5 fathoms ($9^{m}1$) over it, and on which the sea breaks in heavy weather, lies about 5½ miles northward of Bobon point.

Chart 3808.

Wright shoal, with a least depth of 6 fathoms ($11^{m}0$) over it, lies 10 miles north-north-eastward of Bobon point. A shoal, with a depth of about 5 fathoms ($9^{m}1$) over it, lies about 1½ miles southward of Wright shoal. The sea breaks heavily on these shoals in bad weather.

Catarman (Katarman) shoal (*Lat. 12° 34′ N., Long. 124° 38′ E.*), with a depth of one fathom ($1^{m}8$) over it, and on which the sea breaks in moderate weather, lies 3¼ miles north-north-westward of the light-structure at the town of Cawayan (Kawayan). A rocky shoal, with a depth of 4 fathoms ($7^{m}3$) over it, lies 2¾ miles west-north-westward of the light-structure, and about 1¼ miles offshore, and a 5¼-fathom ($9^{m}6$) patch lies about 2½ miles northward of the light-structure.

Coast. — Light. — Dangers. — Beacons. — The town of Catarman (Katarman) is situated on the west bank of Catarman (Katarman) river, which discharges 5¼ miles eastward of Bobon point. It stands about half a mile inland, and is nearly obscured by trees, only the roofs of the houses being visible from the sea. The western side of the river mouth is formed by a long sandspit, which is reported to shift considerably during the North-east monsoon.

A light is exhibited, at an elevation of 35 feet ($10^{m}7$), from a concrete column, on the beach at Cawayan, on the eastern side of the entrance to the river.

From Cawayan two coral reefs, which partly dry, extend about a quarter of a mile northward, forming an inlet between them. The entrance to the inlet is narrow, but is marked by two beacons, one on the extremity of the western reef and the other on a detached rock northward. Maguran reef, a coral reef, which dries, lies northward of the entrance, and protects the landing in bad weather.

There is a depth of 7 feet ($2^{m}1$) in the channel across the bar of the river which is very narrow, and the river is very shallow. In fine weather small launches may enter at high water by keeping close to the end of the sand spit on the western side, and turning sharply south-westward when it is abeam to avoid rocks on the eastern side inside the entrance.

The usual anchorage is in a depth of about 5 fathoms ($9^{m}1$), sand, about half a mile north-westward of the light-structure at Cawayan. This anchorage is frequently unsafe during the North-east monsoon, which sends in a heavy sea.

From Cawayan to Livas point, about 18 miles east-north-eastward, there are few distinctive features. The coast is densely wooded to the water's edge and traversed by ridges, most of which are not over 300 feet ($91^{m}4$) high. Between Cawayan and Bugtu point, about 8½ miles eastward, the coast is fronted by numerous coral reefs. Bugtu river discharges just westward of Bugtu point, and the village of Maquinalo and the town of Mondragon are situated on this coast.

Charts 943, 1263.

Chart 3808.

Bugtu point is fringed by coral, which dries, extending nearly half a mile northward.

Between Bugtu point and Oot point, 4¼ miles north-eastward, lies Bantayan bay, with the villages of Bantayan and Lauangan on its shores. Oot point is a low narrow point extending in a north-westerly direction; its extremity is a mangrove swamp bordered by a reef which extends about 4 cables offshore.

Off-lying islands and dangers.—Hirapsan island, 2¾ miles east-north-eastward of Cawayan and one mile offshore, is about 12 feet ($3^{m}7$) high, but the trees are tall and dense, giving it the appearance of being more elevated than it is. Palijon island, about one mile north-westward of Hirapson island, is a mangrove swamp, all the ground being covered at high water. These two islands lie on the same reef, and between them the reef dries. Fairly good anchorage, protected during the North-east monsoon, may be obtained by vessels with local knowledge westward of Hirapsan island.

Cajoagan (Kahoagan) island (*Lat. 12° 37′ N., Long. 124° 49′ E.*) lies about 3 miles north-westward of Oot point. It is fringed by a reef, beyond which shoal water extends north-westward and eastward.

Within the area bounded by lines joining Hirapsan, Palijon, and Cajoagan islands, and Bugtu point, there are a number of dangerous reefs and shoal patches, with depths of from less than 6 feet ($1^{m}8$) to 3½ fathoms ($6^{m}4$) over them, the positions of which will best be seen on the chart; this area must be navigated with caution. A 7-fathom ($12^{m}8$) patch lies about 5 miles westward of Cajoagan island.

Coast.—Livas point, the western entrance point of Laoang bay, is low, wooded, and fringed with reefs, which extend about half a mile north-north-westward and north-eastward. An extensive detached reef, which dries, and on which are some rocks about 2 feet ($0^{m}6$) high, lies with its north-western extremity 1¼ miles north-westward of Livas point.

The town of Pambuhan is situated at the mouth of the river of the same name about 2 miles south-westward of Livas point. The church at Pambuhan may be easily identified.

Anchorage may be obtained off Pambuhan, in a depth of about 6 fathoms ($11^{m}0$), sand, about half a mile northward of the church. To approach the anchorage vessels should steer for the church, bearing 181°, when about 3 miles distant, and anchor according to draught.

Off-lying danger.—Villalobos reef, with a least depth of 28 feet ($8^{m}5$) over it, lies about 6½ miles northward of Pambuhan church. The sea breaks heavily on it during the North-east monsoon.

Laoang bay.—Beacons.—Laoang bay is entered between Livas point and the northern extremity of Laoang island. The main branch of Catubig (Katubig) river discharges into the south-eastern corner of the bay, widening at the mouth and forming Laoang harbour. The eastern branch, known as Palapag channel, leads into Port Palapag. At high water small craft may pass from Laoang bay into Port Palapag by ascending Catubig river and thence proceeding through Palapag channel. Catubig river is navigable by vessels with local knowledge with a draught of 10 feet ($3^{m}0$) as far as Catubig (Katubig), 10 miles inland. Three beacons mark the northern side of the channel at the mouth of the river leading to the wharf at Laoang.

Laoang harbour is only three-quarters of a cable wide with depths

Charts 943, 1263.

Chart 3808.

of over 2 fathoms (3m7). Rocky patches extend 6 cables westward from Maculmacul point, the northern entrance point of the river, and form the northern side of the channel into the harbour.

A concrete beacon marks the western edge of the one-fathom (1m8) patch, situated about 3 cables westward of Maculmacul point.

About 1¾ cables south-westward of the same point is the wreck of a steamer, nearly submerged at high water, and difficult to distinguish; it is marked by a concrete beacon. Within the entrance there are sand bars on the southern side of the channel, and on the northern side inside the line of the end of the wharves are rocky reefs. There are five wharves at Laoang, with depths of from 8 to 10 feet (2m4 to 3m0) at their head. At high water, vessels with a draught of 15 feet (4m6) may enter the harbour, but they must moor off the wharves as the swinging room is very limited.

Daranasan island, lying between the southern side of Laoang island and Samar, is low and wooded.

Anchorage.—Directions.—Good anchorage may be obtained, in depths of from 5 to 7 fathoms (9m1 to 12m8), mud, in Laoang bay, sheltered from all winds except those between north and west. During strong northerly winds the sea breaks in depths of 5 fathoms (9m1); at such times protected anchorage may be obtained in Port Palapag.

A vessel bound for Laoang should stand up the middle of the bay and pass close westward of the concrete beacons marking the one-fathom (1m8) patch and the wreck, allowing for the set of the tidal stream; she should then steer to pass just southward of the wharves, and anchor about half a cable from the head of the eastern wharf, in a depth of 3 fathoms (5m5).

Laoang.—The town of Laoang (*Lat. 12° 34′ N., Long. 125° 01′ E.*) stands on a slight eminence on the south-western part of Laoang island; it is the principal port of northern Samar, and a considerable amount of hemp and copra is exported. Vessels call regularly from Cebu and Manila.

Port Palapag.—Light.—Port Palapag, situated at the eastern end of the northern coast of Samar, is formed by the channel that separates Cahayagan and Laoang islands from Batag island; it is partly sheltered from all winds. The reefs which fringe the shores are steep-to. The northern entrance is 6½ cables wide and deep; the eastern entrance is encumbered with several rocky shoals and should not be attempted without local knowledge. The channel between Cahayagan and Laoang islands is too narrow to be navigable by any but small vessels, and the tidal stream in it runs at a considerable rate.

Laoang island is 214 feet (65m2) high near the southern end, and densely wooded. The western side is fringed with a reef, with a bank, with depths of less than 3 fathoms (5m5) over it, extending from 3 to 4 cables offshore.

Cahayagan island, separated from the northern end of Laoang island by a narrow channel, is moderately high and densely wooded. It is fringed by a reef, narrow on the eastern and southern sides, and widening on the northern and north-western sides. The reef from the north-western part extends about one mile and on it are the Macan islets, which are covered with brushwood; the highest has an elevation of 21 feet (6m4).

Batag island is fringed by reefs, which, from the north-western

Charts 943, 1263.

Chart 3808.

part, extend about 6 cables offshore, and into the northern entrance to the port. The large indentation on the western side of the island is encumbered with reefs. The island is 220 feet ($67^{m}1$) high, and densely wooded.

A light is exhibited, at an elevation of 325 feet ($99^{m}1$), from a white circular concrete tower, on Batag island, about 1¾ miles southward of Atalaya point, its northern extremity; the dome of the lantern is white and the base red. Dwelling houses are situated close southward of the tower.

Calapan islet, on the south-western side of the port, lies on the bank extending from the eastern side of Laoang island and 2 miles southward of the south-eastern extremity of Cahayagan island; it is fringed by a reef.

A shoal patch, with a depth of 2½ fathoms ($4^{m}6$) over it, lies about one mile south-eastward of the south-eastern extremity of Cahayagan island, and in the middle of the port. About 2 cables southward of this shoal is a 4¾-fathom ($8^{m}7$) patch.

Anchorages.—Directions.—Good anchorage for moderate-sized vessels with local knowledge may be obtained westward of the south-eastern extremity of Cahayagan island, in a depth of 5 fathoms ($9^{m}1$), mud; or south-eastward of Leung point, situated 2 miles northward of the south-western extremity of Batag island (*Lat. 12° 37′ N., Long. 125° 02′ E.*), in a depth of 6 fathoms ($11^{m}0$). Large vessels should anchor about half a mile south-eastward of the south-eastern extremity of Cahayagan island, in a depth of 8 fathoms ($14^{m}6$), or farther southward off the south-western extremity of Batag island, taking care to avoid the 2½-fathom ($4^{m}6$) patch, previously mentioned.

Vessels entering from northward should favour the western side of the channel, as the reefs fringing Cahayagan island do not extend as far out as those from Batag island. The south-eastern extremity of Cahayagan island and Leung point are steep-to, and may be rounded fairly close.

Palapag Mesa, a mountain, 1,229 feet ($374^{m}6$) high, about 14 miles south-south-eastward of the lighthouse on Batag island, is visible from off the north coast of Samar, but is more distinctive for its shape, which is flat-topped, rather than its elevation.

Charts 943, 1263.

CHAPTER X

NEGROS AND BOHOL—WEST AND SOUTH-EAST COASTS OF CEBU—SOUTH-WEST COAST OF LEYTE—NORTH COAST OF MINDANAO

Chart 3809.

NEGROS.—The island of Negros, situated between the south-eastern side of Panay and the island of Cebu, is divided into two provinces, Occidental and Oriental Negros. Its coast is very little indented and contains no harbours suitable for large vessels. The rivers are small and unfit for navigation except by small craft. A central chain of mountains runs through its entire length. Canlaon (Kanlaon) volcano (*Lat. 10° 25′ N., Long. 123° 08′ E.*), about 36 miles southward of the northern extremity of the island, is 8,088 feet (2,465^{m}2) high, and is probably the highest point of the island. The island is reported to produce the best cacao in the Visayas, besides rice, sugar, tobacco, and lumber, but owing to the lack of good harbours most of the produce finds its way to market through Manila, Iloilo and Cebu.

Communication.—The southern end of Negros is connected by a submarine cable to Mindanao, and is thus united to the general telegraph system.

Climate and weather.—*See* page 16.

WESTERN SIDE OF NEGROS. — Coast. — Dangers. — Beacon.—The north-western coast of Negros, as far south as Pandan point, has been described on pages 363 and 364.

Between Pandan point and the mouth of Suay river, 28 miles southward, the coast is low, bordered with coconut trees, and fringed by a narrow bank of drying sand in places; it is intersected by numerous rivers which are navigable for small craft. The most important towns on this coast are Binalbagan and Himamaylan (Himamailan), which stand near the mouths of the rivers of the same name, 6 and 12 miles, respectively, southward of Maquiquiling (Makilikil) point, which lies 14 miles southward of Pandan point; these towns are connected to the general telegraph system. A concrete beacon, 27 feet (8^{m}2) high, stands on the southern side of the entrance to Himamaylan river.

The town of Himigaran, situated at the mouth of the river of the same name, about 15 miles southward of Pandan point, may be identified by a small pier on the northern bank of the river, from which a white flag is displayed by day and a light exhibited at night. Vessels

Charts 943, 1263.

Chart 3809.

are recommended to anchor, in a depth of 5½ fathoms (10^{m}1), with the mouth of the river bearing 054°, and a group of six chimneys, 136°.

Between Himamaylan and the mouth of Ilog river, 9½ miles south-westward, the coast consists of mangroves, and is fringed by a drying bank of sand for 5 miles south-westward of Himamaylan, and of mud thence to the Ilog river.

Binalbagan, Himamaylan and Ilog rivers have a depth of about 1½ feet (0^{m}5) on their bars, with from one to 3 fathoms (1^{m}8 to 5^{m}5) inside, and are navigable for a considerable distance from their mouths. Ilog, a town of some importance, is situated about 4 miles up the Ilog river. Vessels with local knowledge may obtain anchorage, in depths of from 3 to 5 fathoms (5^{m}5 to 9^{m}1), mud, anywhere along this coast, but there is no protection except from the south and east.

From a position 4 miles south-westward of the mouth of Ilog river to Sojoton (Sohoton) point, about 13 miles farther westward, the coast is moderately steep-to and the high land approaches close to the coast. Mount Malapantao, 2,030 feet (618^{m}7) high, and Mount Tantauayan, 1,475 feet (449^{m}6) high, about 11 and 5½ miles, respectively, south-eastward of Sojoton point, are good landmarks. About 3 miles eastward of Sojoton point is a deep valley leading inland, and off it are the only dangers outside the narrow coastal reef; these consist of a coral reef, which dries, lying about 3¼ miles east-north-eastward of Sojoton point and about 4 cables offshore, and a rocky shoal, with a depth of 2¾ fathoms (5^{m}0) over it, 2½ miles north-eastward of the same point and 7 cables offshore.

Cauayan (Kauayan), Isio and Caliling (Kaliling) are small towns on the coast, about 6½, 8½ and 15 miles, respectively, westward of the mouth of Ilog river.

Sojoton point (*Lat. 9° 59′ N., Long. 122° 27′ E.*) is fringed by a steep-to reef which extends about 1½ cables offshore. The land rises steeply from the coast to an elevation of 520 feet (158^{m}5) less than half a mile inland. The point is an excellent landmark when approaching from northward or southward, appearing as a step from the coast to the higher hills farther inland.

About 1¼ miles south-south-westward of Sojoton point is Maquiliguian point, which is over 100 feet (30^{m}5) high near its extremity. A reef, which dries, fringes the point, extending a quarter of a mile northward and south-westward from it. A landing may be effected on either side of the lower neck of land south-eastward, on which the town of Linaon stands.

Between Maquiliguian point and Binigsian point, about 8 miles south-south-westward, the coast consists of alternate coral reefs and bright sandy beaches. About 1¼ miles southward of Linaon is a precipitous bluff, 205 feet (62^{m}5) high. There is a deep valley eastward of the town of Inayauan, situated 2 miles southward of the bluff.

A reef, with a depth of 1½ feet (0^{m}5) over it, lies one mile south-south-westward of Maquiliguian point, and there are depths of 3½ and 4¾ fathoms (6^{m}4 and 8^{m}7) about half a mile westward and northward, respectively, of the reef. A reef, awash, lies 2¼ miles south-south-westward of the same point, and more than one mile offshore. There are several detached reefs, with depths of from one to 3 fathoms (1^{m}8 to 5^{m}5) over them, between the reef awash and the coast, and vessels should not attempt to pass inside it.

Charts 943, 1263.

Chart 3809.

Danjugan (Danhugan) island, 255 feet (77^{m}7) high, lies 1¾ miles northward of Binigsian point; it is fringed by a coral reef, which dries, and is steep-to on all sides. North-westward of the island on the edge of the fringing reef are two islets or rocks, the outer of which is 27 feet (8^{m}2) high. Agutayan islet, 315 feet (96^{m}0) high, lies 4 cables south-eastward of Danjugan island; it is fringed by a wide coral reef. There is a depth of 7 fathoms (12^{m}8) in the channel between the two islands, and 6½ fathoms (11^{m}9) in that between Agutayan islet and the coast of Negros. Both channels are about a quarter of a mile wide.

Binigsian point is fringed with coral, which extends a quarter of a mile south-westward. It is an excellent landmark, and it may be identified by a scar caused by a landslip on the 120-foot (36^{m}6) hill on the point. Anajauan (Anahauan) island, 230 feet (70^{m}1) high, lies 6½ cables south-westward of Binigsian point, and is fringed by a coral reef which extends a quarter of a mile northward. Near the northern end of the reef are several islets, the largest of which is 118 feet (36^{m}0) high. The channel between the fringing reef of Anajauan island and the reef fringing Binigsian point is very narrow, but deep and clear of dangers in the middle. A reef, with a depth of 1½ fathoms (2^{m}7) over it, lies half a mile southward of Anajauan island.

Cartagena bay is entered between a point situated about one mile south-south-eastward of Binigsian point and Buluguisan point, about 2 miles farther southward. Coral reefs extend about a quarter of a mile from the entrance points, and there is a reef, with a depth of 1¾ fathoms (3^{m}2) over it, near the middle of the bay. A sandy beach at the head affords a landing in front of the town of Cartagena.

Between Buluguisan point (*Lat. 9° 47′ N., Long. 122° 23′ E.*) and Bulubadian point, 3¼ miles southward, there is a sandy beach, eastward of which is the long valley of Sipalay river. For about 5 miles southward of Bulubadian point, as far as Obon point, the coast is high and rugged. Matatindoc (Matatindok) point, about 1¾ miles southward of Bulubadian point, with a large rock lying on the reef which fringes it, is a good mark for vessels coasting in this vicinity.

Campomanes bay, the only well-protected anchorage on this coast, lies about midway between Matatindoc and Obon points. A reef extends about 3½ cables north-westward from the southern entrance point, and on it are several rocks, the largest of which is about 90 feet (27^{m}4) high and wooded. The middle of the bay is deep, but anchorage may be obtained by vessels with local knowledge, in depths of from 12 to 15 fathoms (21^{m}9 to 27^{m}4), mud, about 2¼ cables southward of the entrance to the river which discharges into the head of the bay, or farther south-eastward as desired. There is a sandy beach at the head of the bay, but elsewhere the shores are fringed with coral.

SOUTH-WESTERN SIDE OF NEGROS.—Coast.—Dangers.—Nabulao bay, entered between Obon point and Catmon (Katmon) point, about 3¼ miles south-eastward, is partially filled with reefs and shoals. A wide reef fringes the shore, and a coral ridge, with an islet on it, extends 1½ miles south-westward from the head of the bay, dividing it into two parts. The north-western part is encumbered with shoals, and one mile south-westward of the island on the reef are some rocks awash lying at the south-eastern end of a shoal. Anchorage may be obtained in the south-eastern part of the bay by vessels with

Charts 943, 1263.

Chart 3809.

local knowledge, protected from north-easterly and easterly winds, in depths of from 9 to 14 fathoms ($16^{m}5$ to $25^{m}6$), mud, half a mile offshore and about 1½ cables outside the shore reef.

Catmon bay, close south-eastward of Catmon point, is exposed to westerly winds and seas and its shores are fringed by a reef, which, on its northern side, extends 2½ cables offshore. From Catmon point to Cansilan (Kansilan) point, 20 miles south-eastward, the coast is steep-to and has few dangers outside the fringing reef. The high land approaches close to the sea, leaving only a narrow plain with a fringe of coconut palms along the coast. Close south-eastward of Catmon bay is a stretch of sand beach about one mile long, near the middle of which is the town of Hinubaan.

A rocky shoal, with a depth of 3½ fathoms ($6^{m}4$) over it, lies about half a mile offshore abreast the southern end of the beach just mentioned and 2¼ miles south-south-eastward of Catmon point.

At Bolila point, about 4 miles south-south-eastward of Catmon point, the coastal reef widens and extends a quarter of a mile southward from the point. Bolila island lies on the coastal reef between Bolila point and the town of Asia, about 1½ miles east-south-eastward. Partially protected anchorage may be obtained by vessels with local knowledge, in Asia bay, between Bolila island and a detached reef, which dries, lying 4 cables south-eastward of the island. A shoal, with a least depth of 1½ fathoms ($2^{m}7$) over it, lies midway between Bolila island (*Lat. 9° 33′ N., Long. 122° 30′ E.*) and the coast of Negros eastward of it. Small vessels with local knowledge may obtain a more protected anchorage in the north-western or north-eastern corners of Asia bay, being careful to avoid the 1½-fathom ($2^{m}7$) shoal between the island and the town.

From the north-western side of the entrance to Asia river, which discharges about three-quarters of a mile south-eastward of the town of the same name, a reef, which dries, extends about 3 cables south-south-westward, and from the western edge of the reef a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends about 2 cables westward.

At Doog point, about 5½ miles south-south-eastward of Bolila point, the hills are very close to the coast and make the point conspicuous. Calipapa (Kalipapa) and Basay are two villages on the coast about 2 and 8 miles, respectively, south-eastward of Doog point. Tolong bay, entered between Cansilan point and Cauitan (Kauitan) point, about 14 miles south-eastward, is exposed to the south-westward. The eastern part, off the mouth of Tolong river, is deep, but westward of that river the depths increase gradually from the shore to depths of 10 fathoms ($18^{m}3$). Both the Bayauan and Sicopon (San Sebastian) rivers, which discharge into this bay, are closed to all except small boats, though the depths are greater inside. Tolong, at the mouth of Bayauan river, is the most important town on the shores of the bay. Vessels with local knowledge may obtain a fair-weather anchorage off Tolong, in depths of from 4 to 7 fathoms ($7^{m}3$ to $12^{m}8$), mud, from half to one mile offshore. Tolong is connected by telephone with Dumaguete, on the east coast of Negros.

Chart 3827.

From Cauitan point to Siaton point, the southern point of Negros, the coast is steep-to and fringed by a narrow coral reef. Between

Charts 943, 1263.

Giligaon point, 11½ miles south-south-eastward of Cauitan point, and Siaton point strong tidal streams may be expected setting north-westward or south-eastward. Some heavy tide-rips have been encountered off this coast. At Giligaon point the land rises steeply, and with a single coconut palm on its summit, makes the point a good landmark. Dome peak, 2,775 feet ($845^{m}9$) high, and Sharp peak, 2,815 feet ($858^{m}0$) high, about 6½ miles south-eastward of Cauitan point, are also good marks.

Siaton point is clear of dangers and steep-to. It is the termination of a long mountain ridge extending north-westward; its coastline is an abrupt cliff, about 60 feet ($18^{m}3$) high, which extends around the point.

SOUTH-EASTERN SIDE OF NEGROS. — Coast. — From Siaton point to Bonbonon point, 6½ miles eastward, the coast is generally low, sandy, and bordered with coconut trees; it is clear of dangers and steep-to. It is the termination of a large valley which extends a considerable distance northward. Siaton river discharges about one mile north-eastward of Siaton point. The town of Siaton, which is not visible from seaward, is situated about one mile inland, on the east bank of the river. Canaway river discharges about three-quarters of a mile eastward of the mouth of Siaton river. Off the mouths of these rivers there are sand bars which extend about a quarter of a mile offshore and are steep-to. Vessels with local knowledge may obtain an indifferent anchorage off the mouth of Canaway river, in a depth of 15 fathoms ($27^{m}4$), sand, about 1½ cables offshore.

Bonbonon point (*Lat. 9° 03′ N., Long. 123° 07′ E.*), clear of dangers and steep-to, is the termination of a long ridge, which trends northward. A cliff, about 40 feet ($12^{m}2$) high, extends around the point. Northward of the point the land rises steeply, attaining an elevation of over 200 feet ($61^{m}0$) at a distance of half a mile inland.

Current.—The following remarks are taken from a report by Mr. W. J. Sturmey, Master of the motor barque *Dolphin Shell*, 5th May, 1921:—

Between January and May, 1921, a strong westerly current was experienced setting past Port Bonbonon and Siaton point; when past the point it set strongly north-westward until about 60 miles westward of Siaton point. Thence to Balabac strait the current set south-west, on one occasion as much as 28 miles in a day.

For remarks on the tidal streams off the southern end of Negros, *see* page 484.

Port Bonbonon.—Port Bonbonon, entered about three-quarters of a mile north-westward of Bonbonon point, is a small inlet which affords good protection for small craft with local knowledge at all times. The channel at the entrance is about a quarter of a cable wide at the narrowest part, and has a least depth of 3 fathoms ($5^{m}5$).

Anchorage.—Directions.—The best anchorage in Port Bonbonon is in a depth of 5 fathoms ($9^{m}1$), mud, off the mouth of Talocoy river, which discharges into the north-western side of the port, where there is a width of about 1½ cables.

As the reefs on both sides of the channel show plainly, Port Bonbonon is comparatively easy of access in the daytime. The northern side of the eastern entrance point is clear of dangers and fairly steep-to and may be passed at a distance of about half a cable. After passing

Chart 3827.

this point a vessel should keep towards the southern shore, as a small reef, generally marked by a fish-trap, extends from the first point on the northern side. From here the shores of the port to within a quarter of a mile from the head are clear of dangers to within half a cable, and steep-to.

Coast.—From Bonbonon point to Zamboanguita point, about 5½ miles north-eastward, the coast is generally low and sandy, and fringed by a narrow, steep-to coral reef. Zamboanguita point is flat and sandy; shoal water extends about a quarter of a mile southward from it. The town of Zamboanguita, concealed by coconut trees, stands on the point. Between Bonbonon point and Port Siyt, about 2 miles north-eastward, the sandy beach is broken by some steep cliffs.

Port Siyt is somewhat similar to Port Bonbonon and affords good shelter for small craft. The narrowest part of the channel at the entrance has a width of only 40 yards ($36^{m}6$), and a least depth of 6 fathoms ($11^{m}0$). The best anchorage for vessels with local knowledge is near the head of the harbour, where there is a width of about 1½ cables, in a depth of 7 or 8 fathoms, soft mud. As the reefs on both sides of the entrance are plainly visible, access is comparatively easy.

Off-lying island.—Light.—Apo island (*Lat. 9° 05′ N., Long. 123° 16′ E.*), 393 feet ($119^{m}8$) high, lies 4 miles eastward of Zamboanguita point. Rocks awash extend 1¼ cables southward from the island; the remainder of its coast is steep-to. The northern end is a tableland, sloping steeply on all sides; the southern end is about 150 feet ($45^{m}7$) high, and in the middle the land is low and cultivated. In the channel between the island and the coast of Negros there is a constant south-going current with a variable rate.

A light is exhibited, at an elevation of 428 feet ($130^{m}4$), from a concrete tower, with a white dwelling attached, on the summit of Apo island.

Coast.—From Zamboanguita point to Dumaguete point, 14 miles north-north-eastward, the coast is clear of dangers and steep-to, and the depths are too great for anchorage; it is formed of coral sand, bordered by coconut trees or grass. The country for half a mile inland is practically flat and then rises gradually to the mountain range which marks the south-eastern part of Negros. Dauin point, about 7 miles north-eastward of Zamboanguita point, is sandy, flat, and covered with trees somewhat higher than those generally found in this vicinity. It is clear of dangers and steep-to. The town of Dauin stands close westward of the point. It contains a prominent church standing on a slight elevation, and the ruins of two stone forts. Bacong (Bakong) village, which also has a prominent church, is situated 4 miles north-north-eastward of Dauin point.

Cuernos de Negros are three well-defined peaks, the highest of which is conical and has an elevation of 6,244 feet ($1{,}903^{m}2$), situated about 6½ miles westward of Bacong village. They are well wooded and on their eastern side there is a deep valley which extends to the coast at Dumaguete.

Dumaguete.—Light.—Dumaguete point is flat and sandy. The river of the same name discharges northward of the point. Dumaguete, the capital and largest town of Oriental Negros, is situated on the northern side of the mouth of the river and is prominent from

Charts 3809, 943, 1263.

Chart 3827.

seaward. It is connected to the general telegraph system. The exports are hemp, copra, and sugar.

There is a pier 500 feet (152m4) long at the northern end of Dumaguete, and, in 1948, had depths of from 10 to 26 feet (3m0 to 7m9) alongside its northern face, and from 15 to 35 feet (4m6 to 10m7) alongside its southern face. Provisions may be obtained. Water is laid on to the pier.

A light is exhibited, at an elevation of 38 feet (11m6), from a white concrete tower, on the pier at Dumaguete.

Anchorages.—Vessels usually anchor east-north-eastward of the light-tower, in a depth of about 15 fathoms (27m4). Anchorage may also be obtained by vessels with local knowledge, in depths of from 10 to 25 fathoms (18m3 to 45m7), with the belfry close south-eastward of the church, bearing 240°. Close outside the line joining Dumaguete point and the point northward of the town there is a depth of 25 fathoms (45m7) ; inshore of this the depths decrease rapidly.

The anchorage off Dumaguete is bad ; the bank being steep-to and the holding ground poor, vessels are liable to drag off into greater depths. It is open eastward, and during the North-east monsoon is frequently unsafe. Landing at times is dangerous and even impracticable.

Storm signals.—Storm signals are shown at Dumaguete. *See* page 11.

Coast.—From Dumaguete to Calongcalong (Kalongkalong) point, about 2 miles northward, the coast is low, sandy, and fringed by a narrow steep-to coral reef. About half a cable north-eastward of the point are two small sand cays on the edge of the coastal reef.

The coast northward of Calongcalong point is described on page 459.

Chart 3824.

NORTHERN SIDE OF NEGROS.—Coast.—Ilacaon point (*Lat. 11° 00′ N., Long. 123° 12′ E.*), the northern extremity of Negros, and the dangers northward and westward of it have been described on page 361.

From Ilacaon point to Sagay (Sagai point), the north-eastern extremity of Negros, the coast is low, generally fringed with mangroves, intersected by a number of streams, and fronted by dangerous shoals and reefs which partly dry.

About 3 miles eastward of Ilacaon point is Sicaba (Sikaba) point, the western entrance point of Sicaba (Sikaba) river. This river, though deep inside its entrance, is of little commercial value, due to the bar and shoals at its mouth, except for small craft, which can enter at high water. Sicaba (Sikaba) village is situated on the northern side of the entrance. Talabaan Grande and Talabaan Chico rivers are unimportant streams discharging about 1½ and 3½ miles, respectively, south-eastward of Sicaba point.

Off-lying dangers.—Sicaba (Sikaba) reefs are two extensive coral reefs which dry, lying within 2¼ miles east-north-eastward of Sicaba point, with shoal water between them and the point. About 6½ cables north-eastward of the outer Sicaba reef is a shoal, with a depth of about one foot (0m3) over it, and 3½ cables northward of the northern extremity of the same reef is a 9-foot (2m7) patch.

East rock, with a depth of 1½ feet (0m5), coral, over it, lies 2½ miles

Charts 3808, 3809, 943, 1263.

Chart 3824.

northward of Sicaba point, and a 27-foot (8^{m}2) patch lies nearly 3 miles north-north-westward of the same point.

Daga reef, which dries, lies 3¾ miles eastward of Sicaba point, and 1½ miles offshore.

Carmen shoals, with depths of from 6 to 16 feet (1^{m}8 to 4^{m}9) over them, and with large boulders on them, lie about 6 miles east-north-eastward of Sicaba point. Sacramento rock, about 4 miles north-westward of Carmen shoals, is described on page 361.

Coast.—Lights.—The town of Cadiz stands on the western side of the entrance to the river of the same name, about 5 miles south-eastward of Sicaba point. It is nearly obscured by coconut palms. The bar of the river nearly dries, but at high water small craft can cross it and lie aground at the head of a small wooden pier off the middle of the town.

A good anchorage may be obtained by vessels with local knowledge off Cadiz, in a depth of 6½ fathoms (11^{m}9), with the mill chimney bearing 234°. Some powerful white lights, which may be seen from a distance of 20 miles, are occasionally shown from near the top of the chimney.

At Pandanan point, 3½ miles eastward of the town of Cadiz, and for a short distance on either side of the village of Tiglauigan, about one mile westward of Pandanan point, is a rocky bluff, about 30 feet (9^{m}1) high, inland of which the country is higher and grassy in places.

Himugaan river, the largest river in northern Negros, discharges on the eastern side of Himugaan point, about 1¼ miles eastward of Pandanan point (*Lat. 10° 58′ N., Long. 123° 32′ E.*). At its mouth are numerous sandbanks, which dry. The bar is liable to change and is entirely unprotected during the North-east monsoon. The channel across the bar is generally marked by beacons and buoys, privately maintained, which are liable to be shifted. The bar is passable by small vessels of 8 or 9 feet (2^{m}4 or 2^{m}7) draught, at high water, and the river is navigable for a distance of 7 miles. In the fine weather season vessels lie outside the bar and load from lighters.

Two lights, vertically disposed, are exhibited, at an elevation of about 30 feet (9^{m}1), from an iron framework beacon, on the eastern side of the entrance to Himugaan river.

The town of Sagay (Sagai) is situated on the coast about 2 miles south-eastward of Himugaan point, and about 3 miles farther south-eastward the Tabanon and Bolanon rivers discharge. They are of little commercial importance, but small craft with local knowledge can cross the bar at their common mouth at high water. Talusan bay is an open indentation in the mangrove swamp on the south-western side of Sagay point, which can be entered by light-draught vessels at high water; there is a narrow basin in the south-western part of the bay where small craft may lie.

Good anchorage may be obtained, in a depth of 8 fathoms (14^{m}6), sand and mud, off Sagay, with the light-beacon at the entrance to Himugaan river, bearing 173°, and Suyac islet, 120°.

Sagay point is low and composed almost entirely of mangroves; there is a small area of firm ground on the eastern side of the point at the village of Panalsagon. The point is fringed by a reef which dries, extending a quarter of a mile from the northern side and one mile from the eastern side. Vessels should only approach Sagay during daylight.

Charts 3808, 3809, 943, 1263.

Chart 3824.

Off-lying islands and dangers.—Suyac (Suyak) islet is a low islet surrounded by a reef which dries, lying 3 miles west-north-westward of Sagay point, and one mile offshore. Between the islet and the coast of Negros there is a narrow channel, with a depth of 10 feet (3^m0).

Carbin (Karbin), Panal and Maca (Maka) are three dangerous reefs lying northward of the eastern end of the northern side of Negros; they consist of sand and coral and have shifting sand cays on them, which are usually plainly visible. Carbin and Panal, which are awash, lie 3¼ and 6 miles, respectively, north-westward of Sagay point; Maca reef, which dries, lies 7¼ miles north-north-westward of the same point. Maca (Maka) shoal, with a depth of one foot (0^m3) over it, lies about 1¼ miles north-north-eastward of Maca reef. There are numerous shoals extending northward (*see* page 360), and those farther eastward are described on page 446. Vessels passing northward of Negros usually pass between Panal and Maca reefs, where the channel is deep and about 2 miles wide.

Between Sagay point (*Lat. 10° 56′ N., Long. 123° 30′ E.*) and the south-western end of Bantayan island, about 17 miles north-eastward, there is a chain of islands, the greater number of which lie on one extensive reef, leaving two good channels between them and Negros.

Asuncion pass.—Dangers.—Asuncion pass, between Sagay point and Molocaboc (Molokabok), Diutay (Diutai), and Matabas islands, north-eastward of it, is deep in the fairway and about one mile wide between the reefs, which dry, on either side. These islands are low, wooded, and lie on one reef, which dries and is steep-to. There are three villages on Molocaboc island, the other islands are uninhabited.

Pamaaun reef, which dries, lies on the southern side of Asuncion pass, about 3½ miles east-south-eastward of Sagay point. On the south-western part of the reef is a sand cay, which dries about 6 feet (1^m8).

Coast.—Between Sagay point and Vito point, about 2½ miles south-south-eastward, there is very little firm ground, mangroves covering the reefs from half a mile to one mile offshore. This coast is fringed by a reef, which dries, over one mile outside the edge of the mangroves. Panalsagon point is the eastern extremity of an islet lying close south-eastward of Sagay point.

Between Vito point and Mocaboc (Mokabok) point, about 4¼ miles south-eastward, is Escalante bay, which is fringed by a wide coral reef, which dries. Escalante village stands on the southern shore of the bay, about three-quarters of a mile south-westward of Mocaboc point. Reefs, which dry, extend nearly half a mile from the village. Vessels with local knowledge desiring to communicate with Escalante enter Danao river (page 445) or anchor outside northward of the bar, in depths of 2 or 2½ fathoms (3^m7 or 4^m6), and land on the beach. Mocaboc point, about 40 feet (12^m2) high, is formed of yellow clay and rock. It is fringed by a reef which extends a quarter of a mile northward and continues along the shores of Escalante bay.

Mount Solitario, 6 miles west-south-westward of Mocaboc point, is a prominent, cone-shaped, wooded peak, 1,119 feet (341^m1) high. It may be easily identified from northward and eastward of Negros, and together with Pan de Azucar island (page 359), in the northern approach to Guimaras strait, is a valuable landmark for vessels navigating the reef-strewn waters northward of Negros.

Charts 3808, 3809, 943, 1263.

Chart 3824.

The east coast of Negros is described on page 449.

Off-lying islands and dangers.—Bagunbanua island, covered with bushes, lies on the south-western side of an extensive reef, which dries, about 1¾ miles northward of Mocaboc point. Between the north-eastern side of this reef and Pamaaun reef is a rocky shoal, with a depth of about one foot ($0^{m}3$) over it, with a channel, with a depth of 4 fathoms ($7^{m}3$) in the fairway between them ; there is also a channel, with a depth of 22 feet ($6^{m}7$) in the fairway, between this shoal and Pamaaun reef. Between the reef on which Bagunbanua island lies and the reef fringing the coast of Negros there is a channel 1½ miles wide, but it is encumbered with several rocky patches, with depths of from 9 to 18 feet ($2^{m}7$ to $5^{m}5$). A reef, which dries, lies half a mile south-eastward of Bagunbanua island and between them is a narrow channel, with a depth of 9 feet ($2^{m}7$).

Panalsalon reef, which partly dries, lies about one mile southward of Bagunbanua island. On the part which dries are some large boulders, awash at high water. Between this reef and the reef south-eastward of Bagunbanua island there is a deep channel, a quarter of a mile wide, and between Panalsalon reef and the reef fringing the coast of Negros westward and southward of it there is a channel, with a least depth of 6 fathoms ($11^{m}0$).

Danao river.—Light.—Danao river, which discharges between Mocaboc point (*Lat. 10° 51′ N., Long. 123° 34′ E.*) and Ocre point, about 3 miles southward, has a least depth of 2 fathoms ($3^{m}7$) on its bar, deepening inside to 10 and 12 fathoms ($18^{m}3$ and $21^{m}9$). Ocre point is 50 feet ($15^{m}2$) high, and is composed of yellow clay and rock.

The channel across the bar is narrow and tortuous, and has a least width of half a cable with depths of over 2 fathoms ($3^{m}7$). The river is about 3 cables wide at the entrance, but soon narrows to one cable, and varies in width from that to half a cable for a distance of 4 miles up ; the banks are steep-to.

On the north bank about half a mile inside the bar is a dilapidated wharf, close inland of which is a shed with a galvanised iron roof, which is a good landmark.

A light is exhibited, at an elevation of 37 feet ($11^{m}3$), from a white concrete beacon, on the wharf, on the northern side of Danao river.

Good protected anchorage may be obtained by vessels with local knowledge anywhere inside the bar ; the anchorage space off the wharf is only about half a cable wide with depths of over 2 fathoms ($3^{m}7$).

Vessels entering Danao river should proceed with caution, as there are no buoys or beacons ; considerable difficulty is found in turning, especially on an ebb tide.

NORTHERN APPROACH TO TAÑON STRAIT. — Islands and dangers. — Lights. — The northern approach to Tañon strait lies between the west coast of the northern part of Cebu and the chain of islands extending north-eastward of Sagay point. Guintacan island, in the middle of the northern approach to Tañon strait, has been described on page 357.

Bantayan island, the largest and northernmost island of the group extending north-north-eastward from the north-eastern end of Negros, is 295 feet ($89^{m}9$) high in the northern part ; between this hill, which is steep on its northern side, and the northern point, the island is level

Charts 3808, 3809, 943, 1263.

Chart 3824.

and only about 20 feet ($6^{m}1$) high; on the southern side the land gradually slopes to the southern point. The island is fringed on all sides by reefs, outside which are several detached shoals.

Bantayan, the largest town on the island, is situated on the south-western side on a point of land projecting southward, which is separated from the island by a mangrove swamp. It cannot be approached within one mile except at high water by vessels with a draught of about 6 feet ($1^{m}8$). The prominent objects in the town are the church, a detached bell tower, and the municipal building; the church is red, and the two latter white.

A light is exhibited, at an elevation of 32 feet ($9^{m}8$), from a white concrete tower, on Buntay point, the northern extremity of Bantayan island.

A light is exhibited, at an elevation of 36 feet ($11^{m}0$), from a white concrete tower, on the beach at the town of Bantayan.

From the south-western extremity of Bantayan island, reefs, which dry, and several others extend about 10 miles south-westward. On these reefs are the Don islands, a group of five, consisting of Botiquis (Botikis), Doong, Lipayran, Mambacayao (Mambakayao) and Yao; with the exception of Yao, the south-westernmost, they all lie on the same reef. Yao islet is densely wooded with large trees, the tops of which are about 120 feet ($36^{m}6$) high. It is clear of dangers and steep-to, and can be rounded in safety at a distance of a quarter of a mile, but there is a 5-fathom ($9^{m}1$) patch about one mile west-south-westward of it. The channel between Yao islet and Mambacayao, the next island eastward of it, is a quarter of a mile wide and deep in the middle. Yao islet is very prominent to vessels passing northward of Negros and westward of Bantayan island. A shoal, with a least depth of 9 feet ($2^{m}7$) over it, coral, and steep-to, lies about 3 miles south-eastward of Yao islet.

Between the Don islands and the south-western extremity of Bantayan island are numerous other islands and islets, the largest of which are Panitugan, Maamboc (Maambok), Silagon and Botong.

Perla reef, which dries, lies 2 miles westward of the light-structure at the town of Bantayan.

Lutungan islet lies on the reef extending about 6½ miles westward from the south-western part of Bantayan island, and about 4½ miles west-south-westward of the town of Bantayan (*Lat. 11° 10′ N., Long. 123° 43′ E.*). About 3¾ miles farther in the same direction is Doong reef, which dries 2½ feet ($0^{m}8$). The channel between it and the reef extending westward from Bantayan island is about one mile wide, with a depth of 10 fathoms ($18^{m}3$) in the middle, but there is a 19-foot ($5^{m}8$) patch in its northern approach.

Charts 3823, 3824.

Doha shoal, with a depth of 2 fathoms ($3^{m}7$) over it, and steep-to, lies about 3 miles south-south-westward of Guintacan island.

Chart 3824.

Silion and Jilantangan (Hilantangan) islands lie from about one to 1½ miles off the eastern side of Bantayan island; they are fringed by narrow reefs, leaving a deep channel between them, and also between them and Bantayan island. Silion island, the north-western of the two, is 20 feet ($6^{m}1$) high, and uninhabited. Jilantangan island is 140 feet ($42^{m}7$) high, and steep at the northern end, sloping gradually

Charts 3808, 3809, 943, 1263.

Chart 3824.

to the southern end where there is a village; there are a few trees on the island.

A rock, awash, lies about 1¾ miles south-westward of the town of Santa Fe, situated on the south-eastern point of Bantayan island, and about three-quarters of a mile from the southern side of the island.

Good anchorage may be obtained, in a depth of 7 or 8 fathoms (12^m8 or 14^m6), between these islands and Bantayan island.

Chart 3823.

Bulalaqui point, the northern extremity of Cebu, and the islands northward of it have been described on page 406.

Between Bulalaqui point and Tapilon point, 2¼ miles westward, the coast of Cebu is low and fringed by a narrow reef. Tapilon village stands on the beach about a quarter of a mile eastward of Tapilon point. Tapilon point is 124 feet (37^m8) high, and rocky. Anchorage may be obtained by vessels with local knowledge, about half a mile northward of Tapilon village, in a depth of 7 fathoms (12^m8), sand.

Between Tapilon point and Bantigui point, 1¾ miles west-south-westward, there is a small bay encumbered with reefs, into the head of which Cortejan river discharges through a salt marsh. Bantigui point is low, sandy, bordered with coconut trees, and fringed by reefs and shoal water, which extends half a mile offshore. Daanbantayan, locally known as Candaya, is a small town with a prominent church, of little commercial importance, lying 1¼ miles southward of Bantigui point at the mouth of Dalingding river. Anchorage may be obtained by vessels with local knowledge in fine weather, in a depth of 9 or 10 fathoms (16^m5 or 18^m3), mud, about half a mile westward of the town.

Chart 3824.

Between Daanbantayan and Cauit point, about 5 miles south-westward, the coast is low, sandy, and fringed by a reef which extends nearly half a mile offshore in places. Cauit point is low, flat, covered with coconut trees, and fringed by a narrow strip of steep-to coral reef. Eastward of the point the land rises gradually, and about 1¾ miles inland is 470 feet (143^m3) high. Cauit (Kauit) village, in which there is a prominent church, stands on Cauit point (*Lat. 11° 11′ N., Long. 123° 57′ E.*).

Jibitnil (Hibitnil) island, 110 feet (33^m5) high, and well wooded, lies one mile westward of Cauit point, with a deep channel, clear of dangers in the fairway, between; the coasts of the island are clear of dangers and steep-to.

Western side of Cebu. — Beacon. — Light. — Hagnaya bay is entered between Tajad point, situated about 2 miles southward of Cauit point, and Sabil point, about 3 miles farther southward. Inside a line joining the entrance points the bay is encumbered with reefs and shoals, the greater part of which dry. The shores of the bay are generally fringed with mangroves. Several streams discharge into the bay. Sabil point is low, with a few coconut trees and bushes on it; it is fringed by a reef which extends about half a mile northward and a quarter of a mile westward from it.

A concrete beacon is situated on the edge of the coastal bank about three-quarters of a mile north-eastward of Sabil point. A light is occasionally exhibited on the top of a water tank on the eastern shore

Charts 3808, 3809, 3810, 943, 1263.

Chart 3824.

of the bay, which in line with the concrete beacon, bearing 100°, leads to the anchorage.

A narrow, tortuous channel beginning about half a mile north-eastward of Sabil point, leads to the town of Medellin, at the mouth of Dagosungan river, in the north-eastern part of the bay. Only vessels with local knowledge should attempt to use this channel. They may obtain anchorage, in a depth of 8 fathoms ($14^{m}6$), about half a mile north-eastward of Sabil point. The country in the vicinity is flat and there are no distinctive features.

Daijagon (Daihagon) canal, connecting Hagnaya bay with Bogo bay on the east coast, is about 4 miles long, and dries for about one mile near the middle of its length, where a flat rocky ledge rises through the mud of the mangrove swamp. Both sides are bordered by mangrove swamps for a half to one mile. The canal is only passable by small boats at extreme high water.

Hagnaya village stands on the southern shore of the bay about one mile south-eastward of Sabil point. Small craft with local knowledge can reach the pier at the village at high water.

From Sabil point nearly to Mangcao (Mangkao) point, about 5 miles south-south-westward, the coast is fringed by a narrow, steep-to, coral reef, which partly dries. Between Sabil point and San Remigio village, about 1½ miles southward, are some rocky islets, from 6 to 10 feet ($1^{m}8$ to $3^{m}0$) high, lying on the coastal reef, from half a cable to 1½ cables offshore. There is a large prominent white, stone church in San Remigio. Anchorage may be obtained by small vessels with local knowledge, in a depth of 15 fathoms ($27^{m}4$), with the church bearing, 091°, and the outer of the two rocky islets on the reef northward in line with Sabil point; there is barely swinging room to clear the reef at this anchorage.

Mangcao point is steep-to, and can be safely passed at a distance of half a mile. The extremity of the point consists of low cliffs, 2½ miles east-north-eastward of which is the summit of Guintorijan (Guintorihan) hill, rising gradually from the point to an elevation of 270 feet ($82^{m}3$). About one mile south-eastward of Mangcao point the fringing coastal reef appears again and gradually widens until at Bangtad point, a mile farther, it extends about three-quarters of a mile southward.

Good anchorage for small vessels with local knowledge may be obtained off the mouth of Lambusan river, which discharges eastward of Bangtad point (*Lat. 11° 00′ N., Long. 123° 55′ E.*), between the reef extending southward from that point and the reef fringing the coast southward of it, in a depth of 6 fathoms ($11^{m}0$), mud. Good protection will be found from all winds except from south-west.

Charts 3824, 3827.

TAÑON STRAIT.—Tañon strait, between Negros and Cebu, has a least width of about 3 miles at its southern entrance, and is deep and clear of dangers in the fairway. On the Cebu side there are no off-lying dangers except Tajao (Tahao) reef (page 453), and the coastal reef is steep-to. On the Negros side there are a few detached reefs, none of which, however, lies more than 2 miles offshore. There are no harbours suitable for large vessels on either side of the strait.

Tidal streams.—The tidal streams run at a considerable rate

Charts 3808, 3809, 3810, 943, 1263.

Charts 3824, 3827.

through the whole width of the strait, but decrease rapidly in strength as the strait widens. In the southern part they attain a rate of 5 or 6 knots, with strong races and eddies; at neaps the rate is from 2 to 3 knots. During the South-west monsoon the wind is usually fresh from the northward, drawing down the axis of the strait.

Chart 3824.

Western side of northern part of Tañon strait.—Coast.—Between Ocre point and Paulino point, 16 miles south-south-westward, the coast is fringed by a narrow, steep-to, coral reef, with no detached dangers except a 9-foot ($2^{m}7$) patch, about 3¾ miles south-south-westward of Ocre point, and about half a mile offshore, and a small patch, which partly dries, lying about one mile north-north-eastward of the southern extremity of Paulino point and about 6 cables offshore. The village of Salamanca stands on the coast about three-quarters of a mile southward of the entrance to Salamanca river, which discharges about 3 miles south-south-westward of Ocre point. Arcolon (Arkolon) point lies about 1½ miles southward of Salamanca, and Lemery (Lemeri) point, 5½ miles farther southward. The town of Calatrava is situated on the southern side of the entrance to the river of the same name, about 3 miles northward of Paulino point. It may be identified by a large convent with a galvanised iron roof, near the beach, nearly in the centre of the point on which the town is situated. This convent and an old school are the only buildings visible from seaward.

Anchorage may be obtained by vessels with local knowledge off the southern side of the point on which the town of Calatrava stands, about a quarter of a mile offshore, in a depth of 12 fathoms ($21^{m}9$), with the point bearing 013°.

Between Paulino point and Pinabuntan point, about 1½ miles southward, there is a bight, the head of which is filled by an extensive mangrove swamp, which extends from a quarter to half a mile inland. Ticlin (Tiklin) islet, covered with mangroves, and fringed by a reef, which dries, lies about 4 cables southward of Paulino point. Pinabuntan point is low and covered with mangroves which extend about half a mile from the coast.

Ticlin (Tiklin) reef is a detached coral reef, which partly dries, lying about three-quarters of a mile south-south-eastward of Ticlin islet. On the southern part of the reef is a shifting sand cay, which dries about 3 feet ($0^{m}9$).

Anchorage may be obtained by vessels with local knowledge in a depth of 8 fathoms ($14^{m}6$), from 2½ to 4 cables south-westward of Ticlin islet. Better protected anchorage for small vessels may be had in a basin about 2½ cables in extent, in a depth of 6 fathoms ($11^{m}0$), mud, about 1½ cables north-westward of Ticlin islet, with the south-western point of that islet in line with the sand cay on Ticlin reef, bearing 155°. Two channels lead to this latter anchorage; the northern is the better. In rounding the northern end of the reef fringing Ticlin islet, the depths decrease from 15 fathoms ($27^{m}4$) outside to 5 fathoms ($9^{m}1$) just before the anchorage is reached. The southern channel is narrow and should be marked unless the light is favourable.

Talabe point (*Lat. 10° 30′ N., Long. 123° 27′ E.*), 1½ miles south-westward of Pinabuntan point, is low, flat, and covered with mangroves and coconut trees. The coastal bank extends about 3¾ cables south-eastward from the point. Talabe river discharges at the point.

Charts 3808, 3809, 943, 1263.

Chart 3824.

A coral reef, with a depth of 21 feet (6m4) over it, and steep to, lies about 6½ cables south-eastward of Talabe point; it is the outer danger on the western side of the northern approach to Refugio pass.

Refugio pass.—Lights.—Dangers.—Buoys.—Refugio pass, separating Refugio island from Negros, has a least navigable width of three-quarters of a mile abreast San Carlos point, a low sandy point situated about 2 miles south-westward of Talabe point. The western shore of the pass is mostly fringed with mangroves and bordered by a narrow, steep-to reef.

A light is exhibited, at an elevation of 27 feet (8m2), from a white concrete beacon, on San Carlos point.

A light is exhibited, at an elevation of 150 feet (45m7), near the top of a chimney, situated about 6 cables northward of San Carlos point.

Refugio island is nearly flat, the highest point, in the eastern part, having an elevation of about 50 feet (15m2). It is fringed by reefs, which partly dry, extending half a mile north-north-eastward, and about one mile south-westward from it. A black can buoy marks the edge of the reef northward, and a red conical buoy the edge of the reef south-westward. The coasts of the island are low and rocky, except for a stretch of sand beach on the eastern side, and another on the south-western side. The island is densely populated and well cultivated.

A light is exhibited, at an elevation of 101 feet (30m8), from a white steel tower, with dwelling attached, situated on the northern end of Refugio island.

Ermita rock, composed of coral heads, with a least depth of 3 feet (0m9) over it, and steep-to, lies about one mile south-eastward of Ermita point, the southern extremity of Refugio island. There is a deep channel half a mile wide between the rock and the reef extending from the south-eastern side of Refugio island.

Near the south-western end of Refugio pass are several detached shoals, lying on the north-western side of the fairway, with depths of from 7 to 28 feet (2m1 to 8m5). The shoal nearest mid-channel is a 3-fathom (5m5) patch lying 6 cables from the coast of Negros and about 2 miles south-westward of San Carlos point, leaving a deep channel, one mile wide, between it and the reef fringing the south-eastern end of Refugio island.

San Carlos, the most important town in this vicinity, is situated on San Carlos point (*Lat. 10° 29′ N., Long. 123° 25′ E.*). It is nearly obscured by trees, only a few houses being visible. There are two piers at San Carlos point; the western pier has a depth of 23 feet (7m0) at its head, and the eastern 33 feet (10m1). There is also a pier with a depth of 26 feet (7m9) at its head, extending east-south-eastward from a position 6 cables northward of San Carlos point. There is a crane with a lifting capacity of 10 tons on this pier, and water is laid on to the pier. The chimney, painted grey, with a black band, near the root of this pier is prominent. Sugar and tobacco are exported. There is regular steamer communication with Iloilo.

Anchorage.—Good anchorage may be obtained from 2 to 2½ cables southward of San Carlos point, in depths of from 5 to 8 fathoms (9m1 to 14m6), mud. In approaching this anchorage from the northward, the eastern side of San Carlos point should be given a berth of about half a mile, as a flat, with depths of from 3 feet to 2 fathoms (0m9 to 3m7)

Charts 3809, 943, 1263.

Chart 3824.

over it, extends about 3½ cables in that direction, and as the water is usually muddy, it is not always visible.

Coast.—From the entrance to Mainit river, about 3⅝ miles south-westward of San Carlos point, to the town of Guihulngan (Gihulngan), 20½ miles south-south-westward, there are no prominent features; the hills approach close to the coast, which is fringed with narrow steep-to reefs, off which the depths are generally too great to afford anchorage. The rivers are small and of no value to navigation. This part of the island is well populated, and there are numerous villages scattered along the coast.

Anchorages.—Directions.—Anchorage may be obtained by vessels with local knowledge off De la Vina sugar hacienda, 6 miles south-south-westward of the mouth of Mainit river, well protected during the South-west monsoon, and also from southerly and south-easterly winds by a detached coral reef, which runs parallel with the coast and dries in two places. A vessel approaching this anchorage should steer for a prominent galvanised iron-roofed dwelling, bearing 226°, and anchor in a depth of 5 fathoms ($9^{m}1$), mud, when the mouth of the small stream on the northern side of the hacienda bears 271°. A 2-fathom ($3^{m}7$) patch lies about 2 cables offshore; a vessel approaching the anchorage should pass about three-quarters of a cable south-eastward of this patch.

Chart 3827.

Vessels with local knowledge occasionally anchor off the town of Vallehermoso (*Lat. 10° 20′ N., Long. 123° 20′ E.*), about 1½ miles southward of the De la Vina hacienda. A sandy flat, with a depth of about 3 fathoms ($5^{m}5$) along its outer edge, extends about 1½ cables offshore in front of the village, and immediately outside this flat the depths increase to 10 fathoms ($18^{m}3$), mud, where anchorage may be obtained with Vallehermoso convent, near the coast, and the largest and most prominent building in the place, bearing 271°.

Coast.—Danger.—Light.—About 5½ miles southward of Vallehermoso is Jilaitan (Hilaitan) point, 6 cables east-south-eastward of which is a small reef, with three coral heads, awash, and steep-to; between this reef and the coastal reef there is a deep channel clear of dangers, about one cable wide. This is the only danger in the vicinity.

The town of Guihulngan stands on the southern side of the mouth of a river which is closed by a bar. There is regular steamer communication with other ports. Off the town the depths increase gradually to 3 and 4 fathoms ($5^{m}5$ and $7^{m}3$), about 4 cables offshore, and then abruptly to 12 fathoms ($21^{m}9$), mud, and at about half a mile there are depths of over 50 fathoms ($91^{m}4$). The usual anchorage for vessels with local knowledge, is in depths of from 12 to 15 fathoms ($21^{m}9$ to $27^{m}4$), mud, with the church bearing 290°.

A light is exhibited, at an elevation of 36 feet ($11^{m}0$), from a white concrete beacon, situated on the beach at Guihulngan.

Chart 3824.

Eastern side of northern part of Tañon strait.—Coast.—From Bangtad point (page 448) to Bagasaue point, 16 miles south-south-westward the coast is fringed by a steep-to reef, which extends not more than three-quarters of a mile offshore. Casimon (Kasimon) point, about 8 miles south-south-westward of Bangtad point, consists

Chart 3824.

of dark rocks much underworn. It is fringed by a reef, the greater part of which dries, extending about a quarter of a mile offshore. On this reef is a wooded islet and several rocks. Batauang river, the largest in the vicinity, discharges about 2½ miles southward of Casimon point; its mouth is a small bay in the rocky coast, with a depth of 2 fathoms ($3^{m}7$), but is too small to be of any value to shipping. Tabuelan village is situated about half a mile southward of the entrance to Batauang river.

Tuburan bay.—Beacons.—Tuburan bay is entered between Bagasaue point and Languyon point, 2½ miles south-westward. Bagasaue point is low and fringed by a reef which extends about 3½ cables offshore. Languyon point is low, wooded, and steep-to. In the middle of the bay are several reefs, some of which dry.

Two leading beacons, each consisting of a white triangle with a black vertical stripe in the middle, are situated on the beach at the head of the bay, and in line, bearing 142°, lead between the reefs to the anchorage.

The town of Tuburan is situated on the south-western side of the mouth of the river of the same name, which discharges into the head of the bay. There is a large church and a convent which are good marks. The river can be entered by small craft at high water.

There is a small wooden pier, which, in 1937, had a depth of 6 feet ($1^{m}8$) at its head. The town is connected to the general telegraph system.

Anchorages.—The best anchorage is with the leading beacons in line and Languyon point bearing 229°, in a depth of 5 fathoms ($9^{m}1$), mud. This course leads about 1¼ cables north-eastward of a 15-foot ($4^{m}6$) patch three-quarters of a mile north-westward of the church. Small craft may anchor farther in, in a depth of 2 fathoms ($3^{m}7$), mud, between two coral reefs, which dry.

Coast.—Dangers.—Beacons.—From Languyon point to Carmelo point, about 1¼ miles south-westward, and thence to Macalbang (Makalbang) point, 5½ miles farther in the same direction, the coast is fringed by a narrow, steep-to coral reef. Macalbang point is low and sandy; in the bight between it and Asturias point, 4¼ miles south-westward, the fringing reef extends farther offshore than between Languyon and Macalbang points. Asturias point (*Lat. 10° 34′ N., Long. 123° 43′ E.*) is low, and here the reef extends about a quarter of a mile north-westward.

The town of Asturias, with a prominent church, stands on the northern side of the point of the same name. The fringing reef in front of the town extends about 3½ cables offshore. The landing is at the village of Langob, about half a mile east-north-eastward of Asturias. Two white diamond-shaped beacons mark the channel between the reefs. Vessels should keep midway between the beacons and steer for Langob, bearing 113°.

The bight between Asturias point and Uag point, about 1½ miles south-south-westward, is filled with a shoal, which extends, with depths of less than 3 fathoms ($5^{m}5$), half a mile outside a line joining the two points. Balamban point, about 2 miles southward of Uag point, is low, densely wooded with coconut trees, and terminates in a sandy spit, which dries, outside which are several dangerous rocky patches, the outer patch, with a depth of 10 feet ($3^{m}0$) over it, lying

Charts 3809, 943, 1263.

Chart 3824.

nearly half a mile south-westward of the point. Baliuagan river discharges on the northern side of Balamban point.

Balamban bay.—Light.—Balamban bay is entered between Balamban point and Mambocayan (Mambokayan) point, 1½ miles southward. On the southern side of the bay a coral reef extends one mile north-north-westward from Mambocayan point, with depths of from about one foot to 3 fathoms ($0^{m}3$ to $5^{m}5$) over it.

The town of Balamban, on the northern side of the bay, contains a prominent church and convent, with some barracks northward of them. It is connected to the general telegraph system.

A light is exhibited, at an elevation of 33 feet ($10^{m}1$), from a white concrete pillar at Balamban.

Anchorage.—Directions.—The protection which the anchorage in Balamban bay affords is increased during the North-east monsoon by the sandy spit and reefs extending from Balamban point. Vessels with local knowledge bound into the bay should steer for the light-structure or the seaward gable of the church bearing 083°, anchoring in a depth of 9 fathoms ($16^{m}5$), mud, about 3½ cables from the beach in front of the church. As this line of bearing only leads 1¼ cables from the dangers on either side caution is necessary.

Coast. — Dangers. — Between Mambocayan point and Tajao (Tahao) point, 10½ miles south-westward, there is a very little coral, and the coast is generally clear of dangers and steep-to, no dangers having been found more than half a mile offshore. Toledo, the largest town on this coast, is situated about 3 miles north-eastward of Tajao point. Tajao point is low and steep-to.

There is a concrete pier at Toledo ; in 1938, it was reported to have a depth of 10 feet ($3^{m}0$) at its head. Toledo is connected to the general telegraph system.

Chart 3827.

Bulubugan point lies about 1¾ miles south-south-westward of Tajao point ; thence to Colosi (Kolosi) point, 6 miles farther in the same direction, the coast is fringed by a reef, which mostly dries, extending as much as half a mile offshore.

Tajao (Tahao) reef, which dries, and on which there is a shifting sand cay, lies about half a mile north-westward of Cabiyangan (Kabiyangan) point (*Lat. 10° 18′ N., Long. 123° 35′ E.*), situated about 1¾ miles southward of Bulubugan point ; the outer edge of the reef is steep-to. There is a channel, about 3¾ cables wide at the narrowest part, between Tajao reef and the reefs fringing the coast, through which a depth of 6 fathoms ($11^{m}0$) may be carried.

Anchorage may be obtained by vessels with local knowledge in a break in the reef off the small town of Pinamungajan (Pinamungahan), about 3 miles southward of Bulubugan point, in a depth of 18 fathoms ($32^{m}9$), mud, about 2½ cables offshore with the white gable end of a church, on a slight rise, bearing 078°. By anchoring nearer the southern side of the bight, off a small indentation in the reef, fairly good shelter may be had during the South-west monsoon.

The town of Aloguinsan stands at the mouth of the river of the same name, which discharges on the southern side of Colosi point. Gorda point, about 3 miles south-south-westward of Colosi point, rises to a flat-topped hill, 704 feet ($214^{m}6$) high, 8½ cables southward, and is steep-to.

Charts 3809, 943 1263.

Chart 3827.

Barili bay.—Barili bay, entered between Japitan (Hapitan) point, about 4 miles south-south-westward of Gorda point, and Tayong point, about 6 cables farther, may be identified by a large, white prominent landslip on its southern side. Japitan point is high, rocky, with vertical cliffs, their tops being covered with grass and brushwood; the point is fringed by a reef and shoal water, which extends about one cable offshore. Tayong point is a rocky, vertical cliff, about 60 feet (18m3) high, and the land within rises at about 1¼ miles south-eastward to an elevation of 693 feet (211m2). The point is fringed by a reef and shoal water, which extends about 1½ cables offshore. About three-quarters of a cable northward of the point is a prominent round rock, about 6 feet (1m8) high, much underworn.

A coral reef, which dries, fringes the southern side of the bay, and the head of the bay outside the mangroves is filled with an extensive mud flat, which dries for a quarter of a mile offshore. A canal, passable at high water by small boats, leads through the mangroves at the head of the bay to the town of Barili, a distance of half a mile. The town is not visible from seaward. It is connected by a good road with the town of Carcar (Karkar) on the east coast of Cebu, and thence by railway with the city of Cebu. The village of Guibuangan stands on the southern shore of the bay; it contains a large white house which is a good mark.

Anchorage may be obtained by small vessels with local knowledge, in a depth of 19 fathoms (34m7), mud, with the white house bearing 144°, on which bearing the vessel should approach, and the prominent round rock off Tayong point, 226°.

Coast. — Light. — From Tayong point to Tangil point, about 3½ miles south-westward, the coast is fringed by a narrow, steep-to, coral reef. Tangil point is low, covered with mangroves, and fringed by a narrow reef.

Dumanjug (Dumanhug) bay is entered between Tangil point (*Lat. 10° 05′ N., Long. 123° 26′ E.*) and Dumanjug (Dumanhug) point, about 1½ miles south-westward. Dumanjug point is high, fringed with mangroves, and bordered by a reef which extends about half a cable offshore, and is steep-to; the head of the bay is shallow. Tangil village, in which there are a few warehouses, is situated in the north-eastern corner of the bay, and the town of Dumanhug on the southern shore. There are two stone moles at Tangil, which may be approached to within about one cable by small craft, and there is a small wooden pier, with a depth of 9 feet (2m7) at its head.

A light is exhibited, at an elevation of 32 feet (9m8), from a white concrete pillar situated on the beach at Tangil.

Dumanjug, one of the largest and most important towns on the west coast of Cebu, contains a prominent church. The town is connected with Tangil by a good road which is carried over the reefs on a stone causeway on which there is a noticeable iron bridge.

Anchorage may be obtained by vessels with local knowledge anywhere in Dumanjug bay according to draught, but the anchorage should be approached slowly, as the depths decrease rapidly. A good anchorage for a large vessel is in a depth of 20 fathoms (36m6), with the bridge in the causeway bearing 110° and Dumanjug church, 197°. The best landing for boats is on the beach at the mouth of the Dumanjug river, about a quarter of a mile eastward of the church.

Charts 3809, 943, 1263.

Chart 3827.

Southern part of Tañon strait. — Coast. — From Dumanjug point to Libao hill, a prominent densely wooded hill, 475 feet ($144^{m}8$) high, 4 miles southward, the coast of Cebu is fringed by a narrow steep-to reef. This hill has been mistaken by vessels from southward for Pescador islet. About 2 miles northward of Libao hill is Cambuang (Kamboan) hill, a well defined long ridge, 333 feet ($101^{m}5$) high, with a flat top. With this exception the country in this vicinity is low, flat, and cultivated.

Copton (Kopton) bay is entered between the point abreast Libao hill and Copton (Kopton) point, the northern extremity of Copton peninsula, about 1½ miles westward. The bay is almost entirely encumbered with mud flats and reefs which dry. There is a narrow tortuous channel through which 1½ feet ($0^{m}5$) can be carried as far as the village of Alcantara on the eastern shore of the bay. Off the entrance to this channel the depths increase abruptly to 25 fathoms ($45^{m}7$).

Copton peninsula, low, flat, and covered with coconut trees and brushwood, is connected with Cebu by an isthmus about half a mile wide, from 20 to 50 feet ($6^{m}1$ to $15^{m}2$) high. Copton point is a rocky bluff, about 15 feet ($4^{m}6$) high, much underworn by the sea. It is fringed by a narrow, steep-to reef, on which are four peculiarly shaped rocks, from 10 to 15 feet ($3^{m}0$ to $4^{m}6$) high, near the coast. The western side of the peninsula consists mostly of a yellow steep-to, sandy beach. Tongo point, the southern extremity of the peninsula, is low, covered with coconut trees and terminates in a rocky bluff, about 20 feet ($6^{m}1$) high.

Ronda village is situated on the eastern entrance point of Copton bay. There is a wooden pier at the village extending only a short distance beyond the edge of the shore reef, with a depth of 13 feet ($4^{m}0$) at its head. The depths offshore increase too rapidly to afford anchorage.

Off-lying islet.—Light.—Pescador islet (*Lat. 9° 55′ N., Long. 123° 21′ E.*), 2 miles west-south-westward of Tongo point, is 30 feet ($9^{m}1$) high, with a few bushes on it, and steep-to.

A light is exhibited, at an elevation of 59 feet ($18^{m}0$), from a white concrete pillar on Pescador islet.

Badian bay.—Badian bay, entered between Tongo point and Badian point, about 4 miles southward, has considerable depths in the middle where it is clear of dangers. Its shore from just eastward of Tongo point to abreast the middle of Badian island is fringed by a steep-to reef, which extends about 4 cables offshore in places.

Badian island, in the southern part of Badian bay, lies less than half a mile northward of Badian point, to which it is connected by a reef, which dries; it is 356 feet ($108^{m}5$) high, and cultivated. The greater part of the area between Badian island and the coast of Cebu is filled with reefs which dry. There is a small boat channel over these reefs at high water to the town of Badian, in which there is a church and a bell tower, but they are not prominent from seaward.

Moalboal is a small town in the north-eastern corner of Badian bay, about one mile eastward of Tongo point. The convent, church, and bell tower, situated close together westward of the town, are prominent, as they show up white. The shore in front of the town is fringed by a reef, which dries, extending about 3 cables off, over which a dilapidated stone mole projects south-south-westward.

Charts 3809, 943, 1263.

Chart 3827.

Anchorages.—Anchorage, protected only during the North-east monsoon, may be obtained by vessels with local knowledge, off the head of the mole at Moalboal, in depths of from 8 to 20 fathoms (14^m6 to 36^m6), mud, or during the South-west monsoon, eastward of the northern end of Badian island, about 1¼ miles north-north-westward of the town of Badian, in depths of from 10 to 20 fathoms (18^m3 to 36^m6).

Coast.—About 6 miles south-south-westward of Guihulngan (page 451), on the coast of Negros, is the mouth of Libertad river, but it is completely blocked by a steep-to reef which dries. About 1½ miles farther southward is Pasil point, on the southern side of which Magingin river discharges. The town of Jimalalud (Himalalud), about 2¼ miles south-south-westward of Pasil point, may be identified by a prominent convent with a galvanised iron roof. Anchorage may be obtained by vessels with local knowledge, eastward of the convent, in a depth of 15 fathoms (27^m4), mud, about 1½ cables offshore.

Tayasan point, 5¾ miles south-westward of Pasil point, is steep-to, low, flat, and well cultivated. The town of Tayasan stands on the southern side of Tayasan point, on the eastern side of Tibiauan river. Good anchorage, fairly protected in both monsoons, may be obtained by vessels with local knowledge in the elbow of the coast about three-quarters of a mile south-westward of Tayasan, in a depth of 22 fathoms (40^m2), mud, about 1¼ cables from the beach. The coast in the vicinity of Tayasan point is very steep-to.

Calagcalag (Kalagkalag) bay, entered about 5¾ miles south-south-westward of Tayasan point, is fringed with reefs where good shelter for small vessels with local knowledge can be obtained in either monsoon. It is divided into two parts; the outer part is formed by coral reefs which dry, and has an anchorage area about a quarter of a mile in width. The inner part is entered between two mangrove-covered points, and is fringed with coral; it is merely a narrow curved channel between drying reefs, and is three-quarters of a cable wide at the narrowest part between the reefs. The channel is clear of dangers, with a muddy bottom, shoaling gradually from a depth of 15 fathoms (27^m4) at the entrance to 3 fathoms (5^m5) about half a cable from a causeway which crosses its head.

The outer anchorage should be approached steering 270°, keeping about 1¼ cables southward of the reef forming the northern side of the entrance, and anchoring off the entrance to the inner part, in depths of from 15 to 20 fathoms (27^m4 to 36^m6).

The village of Calagcalag (Kalagkalag) is situated close to the southern entrance point of the bay.

Reef.—Immediately north-eastward of Tinaogan village (*Lat. 9° 47′ N., Long. 123° 09′ E.*), situated 2½ miles southward of Calagcalag village, is Tinaogan reef, a circular ridge of coral, varying in width from half to 2½ cables, and enclosing an area about one mile in diameter, with depths of from 11 to 18 fathoms (20^m1 to 32^m9). This narrow coral ridge dries at the centre of its outer or eastern edge, which lies about 1¼ miles offshore, and is steep-to on all sides. There are shoal heads, with depths of less than 3 fathoms (5^m5), on other parts of it. Manjuyod (Manhuyod) point in line with Diutay (Diutai) islet in Bais bay, 5¼ miles southward, bearing 190°, leads eastward of the reef.

There is no passage between Tinaogan reef and the coast of Negros.

Charts 3809, 943, 1263.

Chart 3827.

Coast.—Between Tinaogan and Manjuyod point, about 4½ miles southward, the coast is fringed by a reef and shoal water which extends about a quarter of a mile offshore in places. Manjuyod point is bold, with rocky bluffs, from 20 to 100 feet (6^{m}1 to 30^{m}5) high for one mile on either side of it ; it is clear of dangers and steep-to. The town of Manjuyod (Manhuyod) is situated about midway between Manjuyod point and Campoyo (Kampoyo) point, 4 miles southward, on the northern side of the mouth of the Manjuyod river. Campoyo point is a narrow strip of low land, on which there are a few coconut trees and some grass. Reefs, which dry, extend one mile eastward and 2 miles south-south-eastward from it.

On the coast of Cebu between Badian point (page 455) and Liloan point, the south-western extremity of the island, there are no bays or prominent points ; it is bold, with hills of moderate elevation lying close inland, and the rivers are small. The land is cultivated and there are coconut trees on the tops of the hills. The coast is bordered by a sandy beach and fringed by a narrow reef for almost the entire length, the edge of which is so steep-to that anchorage can only be obtained at a few places where there are towns, which are scattered along the coast.

The principal towns on this stretch of coast are Alegria, Malabuyoc (Malabuyok), Ginatilan, and Samboan, lying about 8½, 13½, 18½, and 21 miles, respectively, southward of Badian point. They all have prominent churches, which may be seen from a considerable distance ; the church of Malabuyoc has two square sharp towers ; that of Ginatilan is large and white, with a high tower ; that of Samboan has two towers and, with two white houses, stands on the side of a hill, at an elevation of about 150 feet (45^{m}7), from which there are stone steps leading down to the beach. Samboan church is the most prominent landmark in this part of the strait.

About 5 miles southward of Badian point is Guiuanon point, and 8½ miles farther southward is Malabuyoc (Malabuyok) point.

Culasi (Kulasi) point, 3½ miles northward of Liloan point (*Lat. 9° 25′ N., Long. 123° 18′ E.*), is low, rather craggy and white ; thence to Liloan point, the coast is sandy and very steep. At San Sebastian, about three-quarters of a mile southward of Culasi point, there is a concrete wharf, which, in 1938, had a depth of 35 feet (10^{m}7) alongside. Liloan point is the terminus of a spur from the main range of hills, and may easily be identified by an old white fort on its western side ; it is about 50 feet (15^{m}2) high, and sparsely wooded. Between Liloan point and Tañon point, about 1¾ miles eastward, during the west-going stream there is an eddy stream close offshore. Between these two points the coast is bordered by sandy beaches and is steep-to.

Bais bay.—Bais bay, on the western side of Tañon strait, lies between Campoyo point and Canamay (Kanamai) point, about 5¼ miles southward. It is divided into two smaller bays, known as North and South Bais bays. The shores of both bays are low and fringed with mangroves, backed by a large area of cultivated land. Both bays afford good, sheltered anchorage for vessels of moderate size with local knowledge, but are so encumbered with reefs as to make them difficult of access, especially in bad weather. The entrances are between extensive reefs, which partly dry.

Daco (Dako) island, 547 feet (166^{m}7) high, near its northern end,

Charts 3809, 943, 1263.

lies about 2½ miles southward of Campoyo point; the southern end is low and covered with mangroves. There is a narrow boat channel, with a depth of one fathom ($1^{m}8$) at high water between it and the mainland. Reefs, which partly dry, extend more than one mile from the north-eastern point of Daco island and form the southern side of the channel into North Bais bay.

North Bais bay. — Beacons. — North Bais bay, northward of Daco island, is much encumbered with reefs, through which there are narrow tortuous channels where good anchorage may be obtained, but in the absence of any navigational marks they are impracticable without local knowledge, except at low water, when the reefs are visible. The entrance between the reef extending south-south-eastward from Campoyo point and that extending from the north-eastern side of Daco island, is deep and 1¾ cables wide. Diutay (Diutai) islet, 208 feet ($63^{m}4$) high, lies nearly in the middle of the bay near the eastern edge of an extensive reef, which dries, about one mile northward of Daco island.

The town of Bais, standing on the shore in the south-western part of North Bais bay, is an important port, from which sugar is exported.

About one mile north-north-eastward of the town is a wooden pier with a depth of 14 feet ($4^{m}3$) at its head; it is at the head of a long tortuous channel between the reefs, and from it, an embankment of stone and earth, about one mile long, extends over the mud flats to the main road, which passes through Bais.

Another pier extends about 3 cables northward from the northern side of Daco island, and has a depth of about 15 feet ($4^{m}6$) at its head. The channel to this pier is marked by five white concrete beacons, about 15 feet ($4^{m}6$) high; two of the beacons, each surmounted by a black cylinder, mark the port side of the channel when entering; the starboard side of the channel is marked by three beacons, each surmounted by a red cone. The beacons are numbered from seaward, Nos. 1 and 3 on the port side and Nos. 2, 4, 6 on the starboard side.

South Bais bay.—Buoys.—South Bais bay, entered between Canamay point (*Lat. 9° 33′ N., Long. 123° 09′ E.*) and Banlas point, the southern extremity of Daco island, is generally shallow. Canamay point, low and covered with mangroves, is fringed by a reef, which dries, extending a quarter of a mile north-north-eastward, and is marked at its edge by a black can buoy.

A detached reef, which partly dries, lies about a quarter of a mile south-westward of Arboles point, the south-western extremity of Daco island; on its south-western end are some rocks which are usually visible, and its south-eastern end is marked by a red conical buoy. The channel between this reef and that fringing Arboles point is less than half a cable wide, and has a depth of 6 fathoms ($11^{m}0$); it is generally marked by stakes. The main channel is southward and westward of the detached reef just described. On the western edge of this channel there is a small rocky patch, with a depth of about 4 feet ($1^{m}2$) over it.

A pier, which had, in 1938, a depth of 25 feet ($7^{m}6$) at its head, extends nearly three-quarters of a mile northward from the southern shore of South Bais bay, about 6 cables south-westward of Canamay point.

There is a small stone pier, with a prominent concrete building with

Chart 3827.

a nipa roof on it, situated on Guindung point, at the north-western end of Daco island.

Anchorage.—Directions.—Anchorage may be obtained by vessels with local knowledge, in a depth of 9 fathoms ($16^{m}5$), with Arboles point, bearing 306°, and Banlas point, 058°.

A vessel entering the bay should pass about a quarter of a mile southward of Daco island and southward of the red conical buoy; thence she should continue westward until the pier on Guindung point bears 352°, when she should steer for it on that bearing, anchoring in a depth of 3¼ fathoms ($5^{m}9$) when Arboles point bears 091°, or farther northward if the draught permits.

Coast.—Light.—From Canamay point to Amblan point, about 7 miles south-eastward, the coast of Negros is low and bordered partly with mangroves and partly sandy beaches; a steep-to coral reef extends half a mile offshore in places. The town of Tanjay (Tanhai) is situated on the southern side of the river of the same name about one mile above its mouth. This river, which flows out about one mile south-eastward of Canamay point, is small and shallow; the bar at the mouth nearly dries. The coastal reef in this vicinity extends about half a mile offshore. Anchorage may be obtained off this reef by vessels with local knowledge, protected only during the South-west monsoon, in a depth of 10 fathoms ($18^{m}3$), mud.

The town of Polo is situated at the mouth of the river of the same name, 4¼ miles south-south-eastward of Canamay point. This river can only be entered by boats at high water.

A shoal, with a depth of one fathom ($1^{m}8$) over it, lies about three-quarters of a mile offshore east-north-eastward of Polo.

Amblan point is low, sandy, covered with coconut trees, and steep-to. Close westward of it is the town of Ayuquitan (Ayukitan), which may be identified by a brick wall, the remains of a burnt church. This wall is circular at the top and is surmounted by a cross. Anchorage may be obtained by vessels with local knowledge off the town, in a depth of 10 fathoms ($18^{m}3$), sand.

A light (*Lat. 9° 28′ N., Long. 123° 14′ E.*) is exhibited, at an elevation of 32 feet ($9^{m}8$), from a white concrete pillar, on Amblan point.

Coast. — Light. — From Amblan point to Calongcalong point, 9 miles south-eastward, the coast of Negros is bordered with sandy beaches with little coral, and is steep-to and generally clear of dangers. For a distance of 3 miles south-eastward of Amblan point, hills, about 100 feet ($30^{m}5$) high, lie close to the coast; thence to Calongcalong point the land is low and covered with coconut trees, with an occasional rocky bluff. There are several villages on this coast, off which anchorage may be obtained by vessels with local knowledge in fine weather, but generally very close in on account of the great depths. At Tampi village, about 1½ miles south-south-eastward of Amblan point, there is a pier with a depth of 17 feet ($5^{m}2$) alongside. A ferry steamer plies between the village and San Sebastian, in Cebu (page 457).

A light is exhibited from a radio tower about 2½ miles north-westward of Calongcalong point.

For the coast southward of Calongcalong point, *see* page 442.

Chart 3193.

PORT CEBU.—Port Cebu (Sebu) is formed by the channel which

Charts 3809, 943, 1263.

Chart 3193.

separates Mactan (Maktan) island from the east coast of Cebu, and is one of the best harbours in the Philippines.

The channel is narrow and is well marked and lighted. The port can be entered by all classes of vessels from the southern end and by vessels with a moderate draught from the northern end. The north-eastern channel has a least width of about three-quarters of a cable between the 5-fathom ($9^{m}1$) lines and a least depth of 4½ fathoms ($8^{m}2$) in the fairway northward of Bantolinao point (page 460), the southern entrance point. The southern approach to the anchorage off the town of Cebu is about half a mile wide at its narrowest part, and there is a least depth of 5¾ fathoms ($10^{m}5$) on the recommended route (*see* page 463). At the anchorage off the town there is a least depth of 4 fathoms ($7^{m}3$) about 1¾ cables southward of San Pedro light-structure, but there is a 2¼-fathom ($4^{m}1$) patch about 1¼ cables southward of the light-structure.

Pilots.—Pilotage is optional. Pilots may be obtained at Bantolinao point. No pilots are stationed at the southern entrance.

North-eastern entrance.—Buoys.—Beacon.—The coast northward of Bagacay (Bagakai) point, the northern entrance point of the northern approach to Port Cebu, has been described on page 402. Bagacay point is low, rugged, and bordered by a bank, which extends about 1¼ cables offshore. The point rises gradually to an elevation of about 100 feet ($30^{m}5$), about half a mile inland. There is a small pier on the northern side of the point.

For light on Bagacay point, *see* page 461.

Between Bagacay point and the entrance to Cansaga (Kansaga) bay, 3¾ miles south-westward, the coast is fringed by a reef, which dries, which, about midway between, extends about half a mile offshore.

Mactan island consists of an old coral reef, about 8 or 10 feet ($2^{m}4$ or $3^{m}0$) high. Its coasts are generally fringed with mangroves, and the remainder of the island consists of coconut plantations. It is well populated; the only town on the island is Opon on the north-west coast, 2¾ miles south-westward of Bantolinao point (*Lat. 10° 20′ N., Long. 123° 59′ E.*). The light tower on Opon pier is prominent. It was here that Magellan was killed in 1521, after making the first voyage across the Pacific. Magellan's monument stands at the head of Magellan bay, about 2 miles south-eastward of Bantolinao point. There are several villages on the south-eastern side of the island. Inganio stands half a mile eastward of Magellan's monument, thence south-westward are the villages of Mabago, Agos, Marigondon, Gonsiang and Cordova.

Hilutangan channel, between Mactan island and Olango island (chart 3827) south-eastward, is described on page 470.

From Bantolinao point, a reef extends about one mile east-north-eastward and is marked at its outer edge by a black can buoy, No. 1; the edge is also generally marked by fish traps. From Bantolinao point to a position three-quarters of a mile south-westward of Opon, the coast is fringed by a very narrow steep-to reef. Eastward of Bantolinao point is Magellan bay, the head of which is encumbered with reefs, and there are several shoal patches with a least depth of one foot ($0^{m}3$) over them, in the middle. An obstruction, with a depth of 5½ fathoms ($10^{m}1$) over it, was reported, in 1950, to lie about 1¼ miles westward of Panguian point, the eastern entrance point of the bay.

Charts 3827, 3809, 3810, 943, 1263.

Chart 3193.

Panguian point is steep-to, as is also the south-eastern side of the island to the village of Marigondon, about 6 miles south-westward, where the fringing reef begins to widen and continues south-westward for about 4½ miles, and then curves north-westward, and northward towards Cebu.

On that portion of the reef immediately fronting the town of Cebu are a few pillar-like blocks, which are very prominent from the anchorage. At high water the reef is covered, only a few mangrove covered islets, some fishermen's huts standing on great rock piles, the discoloured water and the numerous fish traps indicate the presence and the limits of the reef. The Asiatic Petroleum Company's installation with their wharf, which is in ruins, lies on the north-western edge of this reef.

The reef fringing the north-western side of Mactan island about half a mile north-eastward of Opon is marked by two white concrete beacons, each surmounted by a black drum.

The channel from north-eastward is marked on the north-western side by red conical buoys with even numbers in white, and on the south-eastern side by the black can buoy and the beacons already mentioned; the middle ground off Fort San Pedro in the town of Cebu is marked by a buoy with red and black horizontal bands, and a similar buoy marks a 3¼-fathom ($5^{m}9$) patch, about 3¼ cables westward of Opon light-structure.

On the north-western side of the port, about 2 miles within Bantolinao point (*Lat. 10° 20′ N., Long. 123° 59′ E.*), is a round white tower, named Mandaue. The mud flat which extends north-eastward from the tower is covered with grass and mangroves, and is generally dry. There is a concrete pier, with a depth of 5 feet ($1^{m}5$) alongside, at Mandaue, about 8 cables west-north-westward of the tower. Between the point close westward of Mandaue tower and the town of Cebu, about 3 miles south-westward, there is a bay, with depths of less than 3 fathoms ($5^{m}5$).

Banilad shoals, parts of which are awash, lie on the north-western side of the channel just inside the edge of the bank with depths of less than 3 fathoms ($5^{m}5$), about 1½ miles south-westward of Mandaue tower. A spit extending south-eastward from the north-easternmost shoal is marked on its edge by a red conical buoy, No. 10. Lazarino shoal, with a depth of about 4 feet ($1^{m}2$) over it, lies on the north-western side of the channel about a mile north-eastward of Fort San Pedro. A red conical buoy, No. 12, is moored about 1½ cables south-eastward of this shoal.

Lights.—A light is exhibited, at an elevation of 146 feet ($44^{m}5$), from a concrete tower, and a white dwelling, on Bagacay point.

A light is exhibited, at an elevation of 30 feet ($9^{m}1$), from a white concrete pillar, on the edge of the reef extending northward from Bantolinao point.

A light is exhibited, at an elevation of 33 feet ($10^{m}1$), from a white tower, on the pier at Opon.

Chart 3193, plan of Sebu anchorage.

A light is exhibited, at an elevation of 63 feet ($19^{m}2$), from a wooden framework tower, on the south-east angle of Fort San Pedro.

Chart 3193.

Southern entrance. — Dangers. — Buoys. — Light. — The

Chart 3193.

southern approach to Port Cebu is between the reef extending from the south-western side of Mactan island, and the coast of Cebu and Cauit (Kauit) island, south-westward of the town of Cebu. The port is easy of access by this channel.

The south-western part of the reef extending from the south-western end of Mactan island, known as Lauis ledge, is marked by a small coral islet, which generally has one or two fishermen's huts on it.

A light is exhibited, at an elevation of 34 feet ($10^{m}4$), from an iron framework tower on a concrete dwelling, off the south-western extremity of Lauis ledge, about 6 cables west-south-westward of the coral islet; the light-structure is a good mark.

From the light-structure the edge of the reef extends northward, with a curve eastward, for a distance of 3 miles to the white beacon surmounted by a red cone, No. 4, which marks its north-western extremity, and is generally steep-to. A similar beacon, No. 2, stands on the edge of this reef, 2 miles northward of Lauis ledge light-structure.

Lipata point, the western entrance point of the southern approach to Cebu, is flat and sandy. About three-quarters of a mile south-westward of it is the town of Talisay (Talisai).

Lagundi shoal, with a depth of 2¾ fathoms ($5^{m}0$) over it, lies 2 miles south-westward of Lipata point, and about 6 cables from the northern shore. Osteng shoal, with a depth of 4½ fathoms ($8^{m}2$) over it, and Bogo shoal, with a depth of 2½ fathoms ($4^{m}6$) over it, and marked on its southern side by a black can buoy, No. 1, lie about 5½ and 8 cables, respectively, eastward of Lagundi shoal.

Lipata bank lies in the middle of the southern entrance, between Lipata point and Lauis ledge; the western and larger part dries, and over the eastern patch is a depth of 2 fathoms ($3^{m}7$), marked on its eastern side by a black can buoy, No. 3.

Narvaez reef (*Lat. 10° 15′ N., Long. 123° 52′ E.*), with a least depth of 1½ feet ($0^{m}5$), over it, lies about half a mile east-south-eastward of Lipata point, and between it and Lipata bank.

Lipata bank, Narvaez reef, and the edge of the reef off Mactan island, are marked by fish traps, but as these are being constantly shifted they should not be relied on as marking the edges of the reefs.

A red conical buoy marks the western edge of the bank extending westward from Lauis ledge.

Campanario shoal, with a depth of 2 fathoms ($3^{m}7$) over it, lies about 1¼ miles north-eastward of Lipata point, and on the western side of the fairway. It is marked on its southern side by a buoy with black and red horizontal bands.

Chart 3193, plan of Sebu anchorage.

Cauit island. — Quarantine station. — Cauit (Kauit) island, on the western side of the fairway, about 1¾ miles north-eastward of Lipata point, is low with a grove of coconut trees on it; there is foul ground between it and the coast of Cebu. The quarantine station for Cebu is on the northern part of the island, and a pier, with a depth of 2 fathoms ($3^{m}7$) at its head, extends north-eastward from the northern side. A bank, with depths of less than one fathom ($1^{m}8$) over it, extends about 1½ cables north-eastward and eastward from the north-eastern point of the island, and at about three-quarters of a cable north-eastward of the point is the ruin of an old fort or castle, 10 or 15 feet ($3^{m}0$ or $4^{m}6$) high, which has been partly undermined and

Chart 3193, plan of Sebu anchorage.

thrown out of level. A yellow buoy is moored about half a cable northward of the head of the pier on the northern side of the island.

Vessels approaching the quarantine station from southward should give the ruins of the old fort on the bank extending eastward from Cauit island a berth of about 1¾ cables, and continue northward, rounding the flat and then steering for the anchorage.

Chart 3193, with plan of Sebu anchorage.

Anchorage.—Obstructions.—The usual anchorage for large vessels is in mid-channel abreast the town, in depths of from 6 to 10 fathoms ($11^{m}0$ to $18^{m}3$), or north-eastward of Cauit island, in depths of from 6 to 11 fathoms ($11^{m}0$ to $20^{m}1$). In the South-west monsoon season good anchorage may be obtained north-eastward of Fort San Pedro. The holding ground is good in most parts of the harbour, but just southward of the fort the ground is hard and anchors are liable to drag.

For depths at the anchorage, *see* page 460.

There are several obstructions, the positions of which may best be seen on the chart, in the southern entrance to the anchorage off Cebu.

Chart 3193.

Directions.—From a position 090°, 1½ miles from Bagacay point light-structure, a vessel should steer for Bantolinao point light-structure, bearing 230°, passing about 2 cables north-westward of No. 1 black can buoy ; when abeam of the latter she should steer to pass about 1¼ cables northward of Bantolinao point light-structure and thence between the buoys and beacons.

The practicable channel is about one cable wide in the narrowest part, which is south-eastward of Mandaue tower (*Lat. 10° 19′ N., Long. 123° 57′ E.*), and the depth here is from 6 to 10 fathoms ($11^{m}0$ to $18^{m}3$). In case the buoys are missing or out of position, tide-rips on the edges of the shoals and the colour of the water will indicate the channel unless the water is unusually muddy.

The towers of Mandaue and Opon are painted white, and are good marks.

When abreast Opon tower and about a cable from it, steer about 236° with Fort San Pedro light tower a little on the starboard bow, which will lead to the anchorage, but this course leads over a shoal, with a depth of 4¼ fathoms ($7^{m}8$) over it, on the north-western side of the channel, about half a mile eastward of Lazarino shoal.

The best channel for entering from the southward is that between Lipata bank and Lauis ledge. The channels northward of Lagundi, Osteng, and Bogo shoals, and westward of Lipata bank and Campanario shoal are not recommended.

A vessel should steer for the Capitol dome, which is conspicuous, situated 1¾ miles north-westward of Fort San Pedro light-structure, bearing 003½°, which will lead about midway between the buoys marking Lauis ledge and Lipata bank, but over a 4¼-fathom ($7^{m}8$) patch lying about 1½ miles north-eastward of Lipata point. When Fort San Pedro tower bears 058° she should steer for it on that bearing, and anchor as requisite.

Chart 3193, plan of Sebu anchorage.

Tidal streams.—The tidal streams take the direction of the channel, setting north-eastward at a maximum rate of about 1¾ knots,

Chart 3193, plan of Sebu anchorage.

and south-westward at a maximum rate of about 1½ knots. During the north-east-going stream there is a strong eddy off Fort San Pedro.

It was reported, in 1937, that the tidal streams set more strongly along the northern shore than along the southern shore; and that the north-east-going stream sets strongly on to the wharf southward of Fort San Pedro, and the south-west-going stream on to the wharves eastward of the Fort.

The times of slack water coincide closely with those of high and low water at Cebu. At high water there is usually a period of about 2 hours of variable currents, from a quarter to half a knot, swinging gradually through south, and at low water there is a similar period with the currents swinging through north. Maximum rates are usually midway between high and low water.

It was reported, in 1937, that there is slack water at the wharves near Fort San Pedro for about 20 minutes on either side of high and low water.

In 1875, H.M.S. *Challenger* reported that the south-west-going stream, immediately following the moon's superior transit, sets with far greater strength than either of the other two tides; the maximum rate was 2 knots.

Cebu.—The town of Cebu (Sebu), the capital of the province of the same name, is the most ancient in the Philippines. It is a port of entry and open to foreign shipping, and is probably the second town of commercial importance. It stands on a large plain at the foot of the chain of mountains that traverses the island throughout its length. The estimated population of the town in 1947 was about 150,000.

The southern and south-eastern sides of the town are bordered by a quay, alongside the greater part of which, vessels with a draught of 25 feet ($7^{m}6$) can lie. Three piers extend from the south-eastern side, and a breakwater extends in a southerly direction from the quay wall about 1½ cables eastward of the entrance to the Guadalupe river.

The depth alongside the coaling pier is from 15 to 18 feet ($4^{m}6$ to $5^{m}5$) and alongside the oiling pier, 13 feet ($4^{m}0$).

It was reported, in 1947, that the three piers had suffered considerable damage. Water is laid on to Nos. 1 and 2 piers.

The following depths alongside the piers were reported in 1948:—

No. 1 pier, south side 26 feet ($7^{m}9$), north side 24 feet ($7^{m}3$).
No. 2 pier, south side 24 feet ($7^{m}3$), north side 19 feet ($5^{m}8$).
No. 3 pier, south side 16 feet ($4^{m}9$), north side 14 feet ($4^{m}3$).

There is an obstruction close off the head of No. 3 pier.

Vessels proceeding alongside the quays are warned that vessels already alongside frequently lay out a stern anchor for hauling off. This anchor is let go some distance from the wharf and the wire from it hauled taut.

At times during the South-west monsoon the berths alongside the quay are untenable, and vessels are obliged to anchor in the stream.

The quay is connected to the Cebu railway.

There are landing steps opposite the Custom house (*Lat. 10° 18′ N., Long. 123° 54′ E.*).

Harbour facilities.—Large quantities of coal and fuel oil are kept in stock.

Water is laid on to the quay. Provisions are plentiful.

Several tugs and lighters are available.

Charts 3827, 3809, 3810, 943, 1263.

Chart 3193, plan of Sebu anchorage.

There are several hospitals at Cebu.

Trade.—The principal exports are hemp, copra, and sugar.

Repairs.—Ordinary repairs to vessels can be carried out at Opon. There is a patent slip at Cebu, details of which are given in Appendix I, and there is one at Opon.

Communication.—There is regular steamer communication with all parts of the Philippines.

Cebu is connected to the general telegraph system, and by railway with Danao, on the east coast, about 15 miles northward, and with Argao, also on the east coast, about 30 miles south-westward.

There is regular communication, by air, with Iloilo.

Radio station.—There is a radio station at Cebu. *See* page 14.

Storm signals.—Storm signals are shown from the signal station at Cebu. *See* page 11.

Deratisation.—For deratisation, *see* page 4.

Climatic table.—*See* page 34.

Chart 3827.

SOUTH-EASTERN SIDE OF CEBU. — Coast. — Beacon. — Dangers.—Between Lipata point and Carcar (Karkar) point, 14½ miles south-westward, there are several towns and villages on the coast, the principal towns being Talisay (page 462) on Talisay point, Minglanilla, about 3 miles westward of Talisay, Naga and San Fernando, 3 and 7 miles, respectively, south-westward of Minglanilla. A tall black chimney (chart 3193) with a white band, about one mile north-westward of Talisay point, is prominent. Much of the coast is bordered by mangroves, interspersed with mud, and cultivated land without any definite high-water mark, and most of it is fringed with steep-to coral reefs; there are a few places where a boat can land at low water in rough weather.

From Lipata point (*Lat. 10° 15′ N., Long. 123° 52′ E.*) to Langtad point, about 8½ miles south-westward, there are numerous detached reefs lying within one mile of the coast. A reef, awash, lies about 2 miles west-south-westward of Talisay point and half a mile offshore. This part of the coast should be given a wide berth. Off Minglanilla, where there is a prominent church, there are several channels between the reefs, but the depths are very irregular and the channels too narrow and tortuous to be of any value. Between Langtad point and Carcar point the coastal reef is narrow and steep-to, and there are no off-lying dangers. The town of Naga may be identified by a church with a large tree in front of it. Anchorage may be obtained by vessels with local knowledge off Naga, in a depth of 15 fathoms ($27^{m}4$), sand, about 3¾ cables offshore, with the church bearing 271°.

Tinaan anchorage, about one mile southward of Naga, is formed by a small bight in the coast and an extensive reef, which is awash, lying about half a mile offshore south-eastward of it, and which is marked near its south-western extremity by a white beacon. There are depths of 5 and 10 fathoms ($9^{m}1$ and $18^{m}3$), sand and mud, in the middle of the anchorage, decreasing to 3 fathoms ($5^{m}5$) a quarter of a mile from the head of the bight. There is a concrete wharf at Tinaan anchorage, capable of accommodating vessels of 15 feet ($4^{m}6$) draught. At low water the reefs are a guide for entering, but the anchorage is only recommended for vessels with local knowledge.

Charts 3809, 3810, 943, 1263.

Chart 3827.

The town of San Fernando, in which there is a prominent church, stands close within Lauis point, about 2 miles south-westward of Langtad point. The coastal reef in front of the town is narrow and steep-to. There are the remains of a small pier which does not extend to the low-water line. Anchorage may be obtained by small vessels with local knowledge in fine weather off the town, in a depth of 20 fathoms (36^m6), sand. Sangat cove, about 2¼ miles south-westward of Lauis point, is shallow and the entrance is narrow. Carcar point is covered with coconut trees, and fringed by a steep-to reef, which, from its eastern side, extends about 3½ cables.

Carcar (Karkar) bay is entered about 1½ miles westward of Carcar point. There is a low mangrove islet on the western side of the entrance, connected with the shore by a reef which dries. The shores are low and fringed with mangroves, and reefs extend from both entrance points and from the shores of the bay, leaving a small anchorage area well sheltered from the sea by the reefs and islet. The entrance to the bay is deep and clear of dangers in the fairway.

Carcar (Karkar) is a small town on slightly rising ground about one mile north-north-westward of the head of the bay, and contains a prominent church. It is connected by rail with Cebu and Argao. A ruined causeway extends through the mangrove swamp between the town and the head of the bay, and continues as a jetty out to the edge of the reef on the northern side.

The best anchorage is in a depth of 7 fathoms (12^m8), mud, on a line between the eastern side of the islet and the head of the jetty. Vessels entering should bring the jetty in line with Carcar church, bearing 334°, before Carcar point (*Lat. 10° 05′ N., Long. 123° 41′ E.*) bears more than 063°, and approach the anchorage on this alignment.

From Carcar bay to Argao point, about 2 miles southward, the coast is mostly bordered with mangroves with a fringing coral reef. The town of Sibonga, about 5½ miles south-westward of Carcar point, contains a prominent stone church. There is a concrete pier with a depth, in 1937, of 8 feet (2^m4) at its head. Water is laid to the root of the pier. Sibonga is connected to the general telegraph system. There is regular steamer communication with other ports in the Philippines.

A shoal, with a depth of 13 feet (4^m0) over it, lies close south-westward of the head of the pier, and another shoal, with a depth of 18 feet (5^m5) over it, lies on the line of the pier and 4 cables offshore. A vessel approaching the pier should pass northward of these shoals.

Between Sibonga and Cerro point, about 4¼ miles southward, there are several detached shoals, none of which lies more than three-quarters of a mile offshore. Argao point is low, flat, and densely wooded; it is steep-to and is well defined from northward or southward. Small vessels with local knowledge may obtain anchorage northward or southward of the point according to the monsoon, but necessarily close in on account of the great depths.

The town of Argao is situated between Argao point and the river of the same name, which discharges about three-quarters of a mile northward of the point. It is the southern terminus of the railway from Cebu, and contains a prominent church. It is connected to the general telegraph system. The beach may be approached very closely,

Charts 3809, 943, 1263.

Chart 3827.

and anchorage obtained in depths of from 15 to 20 fathoms ($27^{m}4$ to $36^{m}6$), sand, with the church bearing 316°.

In the bight south-westward of Argao point the coastal reef extends from 1½ to 3½ cables offshore. A rocky patch, with a depth of 3 feet ($0^{m}9$) over it, lies 3½ miles south-westward of Argao point and about 4 cables offshore. Off the village of Cauayan (Kauayan), about 6 miles south-westward of Argao point, the reef extends about 4 cables offshore and is steep-to. From here to Dalaguete point, about 2¾ miles southward, the reef narrows and ends at the point. Dalaguete point is flat, sandy, densely wooded and steep-to. The town of Dalaguete, which contains a church, is situated on the northern side of the point, and is obscured by trees from southward. Anchorage may be obtained by vessels with local knowledge, in depths of from 15 to 20 fathoms ($27^{m}4$ to $36^{m}6$), sand, close in, with the church bearing 316°, or southward of Dalaguete point, in depths of from 10 to 15 fathoms ($18^{m}3$ to $27^{m}4$), sand, about one cable offshore.

For remarks on the tidal streams in the vicinity of Dalaguete point, *see* page 484.

The coast from Dalaguete point (*Lat. 9° 46′ N., Long. 123° 32′ E.*) to Cayangon (Kayangon) point, 10 miles south-south-westward, is low, with steep sand beaches interspersed by rocky bluffs. The town of Boljoon (Bolhoon), 1½ miles northward of Cayangon point, and several villages are situated on this coast. About 3½ miles south-south-westward of Dalaguete point and about 3½ cables offshore are several detached patches, with a least depth of 1¼ fathoms ($2^{m}3$) over them.

Mambagi reef lies with its outer edge about half a mile eastward of the village of Mambagi, and 5 miles south-south-westward of Dalaguete point. It is composed of rock and sand, and the greater part dries. There is a narrow, deep channel between it and the coast of Cebu.

Boljoon, situated in a cove with considerable depths, may be identified by the white cliffs, about 100 feet ($30^{m}5$) high, on Ili point, on the northern side of the cove. Temporary anchorage may be obtained by vessels with local knowledge off the mouth of the Losapon river, close southward of the town, in depths of from 20 to 25 fathoms ($36^{m}6$ to $45^{m}7$), about half a cable offshore.

Cayangon point is 110 feet ($33^{m}5$) high, and fringed by a reef, which partly dries, extending a quarter of a mile eastward. Iuisan point, about 2½ miles south-south-westward of Cayangon point, is low, and terminates in sand and rocks. Caceres (Kakeres) village is situated on the southern side of Iuisan point.

A shoal, which dries near its centre, lies about one mile southward of Iuisan point, and half a mile offshore. The channel between the shoal and the reef fringing Santa Monica point westward of it is about 2 cables wide, with a depth of over 20 fathoms ($36^{m}6$). Oslob point, about 3 miles south-westward of Iuisan point, is low, sandy, and well wooded, with a prominent white stone fort on its extremity. It is fringed by a steep-to reef, which extends about a quarter of a mile south-eastward. The town of Oslob, situated on the point of the same name, is nearly concealed by trees. The church is a large prominent building with a red tile roof. The town is connected to the general telegraph system. Anchorage may be obtained by vessels with local knowledge on the southern side of Oslob point, in depths of from 4 to 9 fathoms ($7^{m}3$ to $16^{m}5$).

Charts 3809, 943, 1263.

Chart 3827.

From Oslob point to Tañon point, the southern extremity of Cebu, the coast consists of sheer, white cliffs, from 10 to 120 feet ($3^{m}0$ to $36^{m}6$) high, alternating with sandy beaches, and is steep-to and clear of dangers. Tañon point is low and sandy, and fringed by a reef which extends about one cable offshore. The town of Santander, standing on high ground northward of Tañon point, is easily identified. It contains a white church with a prominent tower.

The west coast of Cebu northward of Liloan point has been described on page 457.

Sumilon island, 3¼ miles east-north-eastward of Tañon point and about one mile offshore, is 103 feet ($31^{m}4$) high, and wooded. There is a prominent stone tower, 22 feet ($6^{m}7$) in height, near the southern end. The island is fringed by a narrow steep-to reef which dries. The channel between it and the coast of Cebu is deep and clear of dangers.

Charts 3809, 3810.

BOHOL.—The island of Bohol, situated between the southern ends of Cebu and Leyte, has no good harbours. The southern part is hilly and rocky, but the northern part has fertile valleys and good tracts of level ground. The highest point on the island is 2,630 feet ($801^{m}6$), situated 5 miles north-westward of Nauco (Nauko) point, on the south-eastern side. Mount Cogton (Kogton), in the north-eastern part of the island, is a prominent double peak, 1,505 feet ($458^{m}7$) high, and covered with grass. The rivers are generally small and of little value to shipping. The island is well populated.

Chart 3825.

Northern side of Bohol. — Coast. — Dangers. — The northern coast of Bohol from Centinela point (*Lat. 10° 05′ N., Long. 124° 30′ E.*), the north-eastern extremity of the island, to Tabon point, the northern extremity, about 14 miles north-westward, is indented, mostly fringed with mangroves, and bordered by a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, which extends a considerable distance offshore. The rivers are small except the Ipil, which discharges about 4½ miles south-eastward of Tabon point, and is navigable by craft with a draught not exceeding 5 feet ($1^{m}5$), for a distance of 2½ miles to the village of Ipil.

Lapinin island, separated from the north-eastern side of Bohol by Basiao channel. is generally low, but of rugged appearance. A well-defined hill, 422 feet ($128^{m}6$) high, lies close within the southern point of the island. Its coasts are indented by several bays, fringed with mangroves, except in a few places where there are small stretches of sandy beach, and fringed by reefs. Bonoon, 142 feet ($43^{m}3$) high, Budlaan, and Pamasaun, are three islets lying on the reef fringing the northern side of Lapinin island.

A shoal, with a depth of 4 fathoms ($7^{m}3$) over it, lies 1½ miles north-north-eastward of Aguinin point, the south-eastern extremity of the island, and about three-quarters of a mile offshore ; a 7-fathom ($12^{m}8$) patch and a 2½-fathom ($4^{m}6$) patch lie 2 miles south-south-eastward and 2½ miles south-westward, respectively, of the same point.

Tinuibo islet, 397 feet ($121^{m}0$) high, and steep-to, lies 2 miles south-eastward of Tugas point, the north-eastern extremity of Lapinin island.

Basiao channel is tortuous and about half a mile wide, with a least

Charts 943, 1263.

Chart 3825.

depth of 2½ fathoms ($4^{m}6$) in the fairway which passes south-westward of Lapinin Chico island. This island lies in the middle of the north-western end, is 107 feet ($32^{m}6$) high, and is fringed with mangroves. Small vessels with local knowledge may obtain good anchorage in Basiao channel, in depths of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$), sand and rock. Foul ground extends about 6 cables south-eastward from the south-eastern extremity of Lapinin Chico island; in the channel eastward of the island there is a least depth of 9 feet ($2^{m}7$) and 2 cables wide.

The towns of Ubay (Ubai) and Talibon are situated 2 miles south-westward of Centinela point and 2¾ miles south-eastward of Tabon point, respectively. At Ubay there is a causeway and concrete pier, with a depth of 17 feet ($5^{m}2$) at its head.

Off-lying islands and dangers.—Danajon (Danahon) bank is an extensive bank lying off the northern side of Bohol. Its northern edge consists of a chain of steep-to coral reefs, from half a mile to 2 miles wide, extending from a position about 7 miles north-north-eastward of Tugas point, Lapinin island, westward, approximately parallel with the northern coast of Bohol, to Pandanon islet, situated about 12 miles westward of Tabon point. The only islets on these reefs besides Pandanon are the three small sandy Tood islets at the eastern end of the bank, Danajon (Danahon), 2 miles westward of Tood islets, and the two Caubyan (Kaubyan) islets, about 7½ miles north-eastward of Pandanon. Tood islets (*Lat. 10° 16′ N., Long. 124° 39′ E.*) are covered with bushes; Caubyan islets and Pandanon are wooded; all are low and small. The greater part of these reefs dry, and, being mainly of coral sand, are usually seen. On the western side of North-east pass, 12½ miles from the eastern end of the bank, is a small sand cay, lying on a reef which dries.

On Danajon bank within these reefs, there are a number of low, wooded islets, as well as numerous reefs, some submerged, and others which dry. Between them are numerous intricate and tortuous channels, which should not be used without local knowledge. The shoals and coral reefs are not indicated by discoloration of the water, and in the most favourable light show as brown patches scarcely to be distinguished from cloud shadows.

Near the northern part of the bank are Gaus islet, about 4 miles north-westward of Tugas point, Lapinin island, thence westward are Jinutangan (Hinutangan), Bilanbilangan, Nunu, Talaban and Calituban (Kalituban) islets. Between this group and the Bohol coast, from east to west, are Bantigui, Butan, Maumaun, Malingui, Macaina (Makaina), Sagasay (Sagasai), Cabantulan (Kabantulan), Jau (Hau), Saae, Basaan, Bambanon, Tambu, Guindacpan (Guindakpan), Mahanay (Mahanai), Handayan, Banacon (Banakon) and Masingin islets.

The outer islets mostly have sandy beaches, while those closer to Bohol are fringed with mangroves. Most of the islets are inhabited. The depths in the channels are fairly regular, but there are two 3-fathom ($5^{m}5$) patches about 1½ and 2¼ miles, respectively, west-north-westward of Gaus islet, a 16-foot ($4^{m}9$) patch about three-quarters of a mile eastward of Bantigui, and two 9-foot ($2^{m}7$) patches about one mile and 1¼ miles, respectively, northward of Butan. Calituban (Kalituban) reef, which dries, extends about 13 miles west-south-westward

Charts 3810, 943, 1263.

Chart 3825.

from about one mile north-eastward of Calituban islet, situated 4 miles northward of Tabon point; it shows up well on account of the coral sand, and on it are Calituban, Banacon and Masingin islets.

The area on the bank inside the fringing reefs may be entered through Basiao channel; the channel northward of Lapinin island; North-east pass; Middle pass and North-west pass.

North-east pass, 12½ miles north-westward of Tugas point, has a least depth of 7 fathoms ($12^{m}8$) in the fairway.

Middle pass, about 12 miles westward of North-east pass, is about 1½ cables wide, with a least depth of 4 fathoms ($7^{m}3$) in the fairway. Only vessels with local knowledge should attempt to enter this channel unless the reefs on either side are clearly visible.

Charts 3825, 3827.

North-west pass lies between Pandanon islet and Cabulan (Kabulan) islet, 2¼ miles south-westward, both of which are low and covered with coconut trees. The navigable channel is deep and about one mile wide between the reefs on either side.

The strong and variable tidal streams make the greater part of Danajon bank unsafe for any but very small vessels. The towns on the northern coast of Bohol are small and commercially unimportant, and little commerce is carried on.

Canigao (Kaniago) channel, between the eastern extremity of Danajon bank and the coast of Leyte, is described on page 481.

Coast.—Westward of Ipil river (page 468) there is a belt of undulating country extending from one to 3 miles inland, narrowing westward; southward of this belt are hills, from 600 to 900 feet ($182^{m}9$ to $274^{m}3$) high. The principal landmarks are Cantamulig (Kantamulig) hill, 377 feet ($114^{m}9$) high, 2¾ miles south-westward of Tabon point (*Lat. 10° 10′ N., Long. 124° 17′ E.*), and Mount Corte, 580 feet ($176^{m}8$) high, about 1½ miles southward of Corte point, situated about 8½ miles westward of Tabon point. Cantamulig hill is not easily identified from northward, but is prominent from eastward or westward. Mount Corte terminates abruptly at Corte village, about three-quarters of a mile south-westward, in a cleft which separates it from a densely wooded hill on the coast, 190 feet ($57^{m}9$) high.

Olango and Hilutangan channels.—These channels lie on the south-eastern and north-western sides, respectively, of Olango island, 7¾ miles north-westward of Corte point.

Olango island is low and cultivated. The western and eastern sides are fringed with reefs, and from the southern side a reef, which dries, extends about 4½ miles south-westward, and on which are six islets, namely, Camungi (Kamungi), Sulpa, Panganan, Caohagan (Kaohagan), Hilutangan and Lassuan; of these Hilutangan is about 7 feet ($2^{m}1$) high, and rocky on the western part; the eastern part is low and sandy, and covered with coconut trees. Lassuan, the south-westernmost of the group, is composed of sand, with a prominent clump of coconut trees on it.

The villages of Santa Rosa and Poo are situated on the western side of Olango island, about 2¼ and 3 miles, respectively, south-westward of Mabini point, the northern extremity of the island.

Olango channel is about 2 miles wide at its narrowest part, between Olango and the reef extending north-north-eastward from Pandanon islet, and is deep and clear of dangers in the fairway. Hilutangan

Charts 3810, 943, 1263.

Charts 3825, 3827.

channel, separating Olango and Mactan islands, has a least width of 2 miles, and is deep and clear of dangers in the fairway.

North-western and western sides of Bohol.—Coast.—From Corte point to the town of Loon, about 30 miles south-westward, the coast is low, mostly fringed with mangroves, intersected by several small rivers, and bordered by shoal water. The principal towns are Inabanga, which has a prominent stone church with a square tower, about 8½ miles south-westward of Corte point; Tubigon, with a large church, 7¾ miles farther south-westward; and Calape (Kalape), 6¾ miles south-westward of Tubigon. Corte village stands at the head of a small cove with a sandy beach about 2¼ miles southward of Corte point, and about 2¾ miles farther south-westward is Pampang village, in which there is a prominent church with a nipa roof.

Inabanga river, which discharges about one mile eastward of Lauis point, situated about 2¼ miles northward of Inabanga, is the largest river on this coast, but its bar can only be crossed by boats at high water. At Tubigon there is a stone pier with a depth of 13 feet ($4^{m}0$) at its head, off which anchorage may be obtained by small vessels with local knowledge, in depths of from 3 to 5 fathoms ($5^{m}5$ to $9^{m}1$), mud.

Mount Alimono, 1,015 feet ($309^{m}4$) high, steep and wooded, lies 4¼ miles east-south-eastward of Tubigon. Mount Ilihan, 730 feet ($222^{m}5$) high, 2 miles south-south-westward of Tubigon, Mount Tanauan, 1,454 feet ($443^{m}2$) high and bare, 3 miles southward of Tubigon, and Mount Candungao (Kandungao), 1,574 feet ($479^{m}8$) high, 3¼ miles south-westward of Mount Tanauan, are prominent.

North-west bank.—Islets and reefs.—The north-west coast of Bohol, between Corte point (*Lat. 10° 09′ N., Long. 124° 09′ E.*) and Poom (Poon) point, the north-eastern entrance point of Calape (Kalape) bay, 4¾ miles west-south-westward of Tubigon, is fronted by North-west bank, which extends from 5 to 7½ miles offshore, and on which are numerous islets and reefs. The outer edge of this bank is steep-to and consists of a chain of islets and reefs, between which are a number of channels leading on to the bank. Cabulan islet (page 470), on the south-western side of North-west pass, is the north-eastern of these islets. Extending south-westward from it are Coamen (Koamen), Magcalingao (Magkalingao), Mocaboc (Mokabok) and Bagambanua islets, all inhabited. Coamen islets are two small sandy islets covered with coconut trees; Magcalingao is a small bare sandy cay; Mocaboc and Bagambanua are similar to Coamen islets. Between Cabulan and Magcalingao, about 1¾ miles south-westward, the reefs partly dry; between the latter and Mocaboc, 2 miles south-westward, there is a patch which dries, and thence to Bagambanua, about 1¾ miles farther south-westward, there is a least depth of 21 feet ($6^{m}4$). About 2¼ miles south-westward of Bagambanua is a reef, which dries, and between them there is a good channel which is deep in the middle.

Extending about 3¼ miles south-westward from the drying reef are several patches, with depths of from 15 to 28 feet ($4^{m}6$ to $8^{m}5$) over them. Between the 15-foot ($4^{m}6$) patch and Mantatao islet, about 2¾ miles southward, is a wide deep channel through North-west bank. The following islets lie in the vicinity of the outer channel through North-west bank:—Panga, about one mile northward of Lauis point, Ambugan, about 1¾ miles west-south-westward of Panga, Pangap and Inanoran, about 6¼ and 9½ miles, respectively, south-westward of

Charts 3809, 3810, 943, 1263.

Chart 3825, 3827.

Ambugan. Tambolian reef, which dries, lies about 4½ miles west-south-westward of Ambugan islet. Between these islets and the Bohol coast there are numerous other islets and reefs, some of which dry, the positions of which may best be seen on the chart. Great care should be exercised when navigating in this vicinity.

Chart 3827.

Coast.—Pangangan (Panganan) island, low and cultivated, lies about a quarter of a mile north-westward of Abucayan point, the south-western entrance point of Calape bay. Magtung point, its north-western extremity, is steep-to ; the remainder of the island is fringed by reefs, which dry on the northern side. The north-eastern point of the island is covered with mangroves, and with the coast of Bohol forms Calape bay, at the head of which is the town of Calape. The north-eastern end of the island is connected to the coast north-eastward by an extensive reef, on which is a mangrove islet. The bay is inaccessible from northward, except to small craft at high water. The southern entrance, southward of Pangangan island, can be used by small craft with local knowledge, but the channel is very rocky and dangerous.

Sandingan island (*Lat. 9° 51′ N., Long. 123° 48′ E.*), 265 feet ($80^{m}8$) high and wooded, lies about 2 miles south-westward of Pangangan island, and is connected to the coast of Bohol by an extensive mangrove swamp. The western side of the island is fringed by a narrow, steep-to reef.

Cabilao (Kabilao) island, 112 feet ($34^{m}1$) high, and wooded, is separated from the north-western side of Sandingan island by Sauang pass, a deep channel, three-quarters of a mile wide. The western side of the island is fringed by a narrow, steep-to reef. The tidal streams in this vicinity set northward and southward at a considerable rate.

The channel between the western side of Bohol and the island of Cebu is known as Bohol strait. For tidal streams *see* page 484.

From the southern end of Sandingan island to Cruz point, about 6½ miles southward, and thence to the town of Maribojoc (Maribohok), 3¼ miles eastward, the coast is fringed by a steep-to reef, which nowhere extends more than half a mile offshore, and there are no off-lying dangers. From Maribojoc to the entrance to Port Tagbilaran, about 5 miles southward, the reef widens, and there extends about 2 miles from the town of Tagbilaran. The coast is bordered partly by mangroves and partly by a bluff, interspersed by sandy beaches. The country is partly cultivated, the main part being covered with bamboo and bushes.

The town of Loon, 2½ miles southward of Sandingan island, stands on the north-western slope of Mount Canmanoc (Kanmanok), which is 1,461 feet ($445^{m}3$) high, situated about 2 miles south-eastward. It contains a large church, standing at an elevation of about 75 feet ($22^{m}9$). A stone mole, accessible only to boats, extends from the town. Loon is connected to the general telegraph system.

Temporary anchorage may be obtained by small vessels with local knowledge, in depths of from 4 to 8 fathoms ($7^{m}3$ to $14^{m}6$), with the head of the mole bearing 097°, distant about 2¼ cables. Care should be taken in anchoring as there are several coral heads in this vicinity, with depths of from 4 to 8 feet ($1^{m}2$ to $2^{m}4$) over them.

Cruz point is a bold promontory, from 20 to 30 feet ($6^{m}1$ to $9^{m}1$)

Charts 3809, 943, 1263.

Chart 3827.

high, sloping down from Mount Canmanoc; it is covered with coconut trees, and on it there is a prominent stone tower in ruins.

Maribojoc bay.—Dangers.—Maribojoc (Maribohok) bay, entered between Cruz point and Cocales (Kokales) point, 5¼ miles south-eastward, is fringed by a reef, which extends one mile from the entrance to Abatan river, which discharges into the eastern side of the bay. This reef continues southward and joins that extending from the northern side of Panglao island.

A reef of sand and coral, with a depth of about one foot ($0^{m}3$) over it, lies about 1¾ miles north-westward of Cocales point (*Lat. 9° 40′ N., Long. 123° 51′ E.*).

The town of Maribojoc contains a large church visible from all parts of the bay. A mole extends south-westward from the town between the reefs. Good anchorage, sheltered only during the North-east monsoon, may be obtained by vessels with local knowledge, with the mole bearing 053°, distant about a quarter of a mile, in depths of from 6 to 10 fathoms ($11^{m}0$ to $18^{m}3$), mud. The edges of the reefs are usually marked by fish traps. Small craft of not more than 8 feet ($2^{m}4$) draught can proceed through a short tortuous channel to within a few yards of the mole.

Abatan river has a depth of 3 feet ($0^{m}9$) on its bar, but greater depths inside. It is navigable to above the town of Cortes, about 1¾ miles from the entrance. Paminuitan hill, about 1½ miles southward of the entrance to Abatan river, and about half a mile inland, is 326 feet ($99^{m}4$) high, and wooded.

Good anchorage and fair shelter may be obtained by vessels with local knowledge about half a mile offshore, with a prominent bushy tree on the reef near the mouth of Abatan river, bearing 018° and Paminuitan hill, 125°. The depths shoal gradually from 15 to 4 fathoms ($27^{m}4$ to $7^{m}3$), and the bottom is mud.

Port Tagbilaran. — Light. — Beacons. — Port Tagbilaran is approached through a channel dredged to a depth of 19 feet ($5^{m}8$), marked by 3 concrete beacons, surmounted by black cylinders on the north-eastern side, and by 4 concrete beacons, surmounted by red cones, on the south-western side, extending south-eastward from the light-beacon situated about one mile south-westward of Cocales point.

A light is exhibited, at an elevation of 45 feet ($13^{m}7$), from a white concrete beacon, situated on the north-eastern side of the entrance to the dredged channel.

There is a pier at Tagbilaran, which, in 1939, had a depth of 20 feet ($6^{m}1$) alongside. Fresh water may be obtained.

Temporary anchorage may be obtained by vessels with local knowledge, in depths of from 20 to 30 fathoms ($36^{m}6$ to $54^{m}9$), close to the edge of the reef north-westward of the light-beacon.

Panglao island.—Panglao island is almost joined to the south-western extremity of Bohol, as Port Tagbilaran, which separates them, is only about a quarter of a mile wide at the narrowest point, and nearly dries. From the village of Dauis, at the north-eastern end of the island, a causeway, in which there are three gaps, spanned by bridges, for the passage of boats, extends to the coast of Bohol. Near the eastern end of the island are two hills covered with coconut trees, the eastern and higher of which is Mount Biking, having an elevation of 646 feet ($196^{m}9$). Another hill in the southern part of the

Charts 3809, 943, 1263.

Chart 3827.

island, covered with coconut trees, and 319 feet ($97^{m}2$) high, rises abruptly from the sea northward of the village of Bolod. The remainder of the island is fairly level and scattered with groves of coconut trees.

The northern side of Panglao island is fringed with a narrow steep-to reef, but from the south-western end an extensive reef, which dries, extends 3¼ miles south-westward, and on it are Pungtud and Gakang islets, both wooded. The town of Panglao, which is accessible only to small craft with local knowledge at high water, is situated at the head of Panglao bay, on the south-western side of the island, between Duljo (Dulho) point (*Lat. 9° 35′ N., Long. 123° 43′ E.*), the western extremity of the island, and Tahuruc (Tahuruk) point, about 2½ miles south-eastward.

Anchorage.—Dangers.—Fair anchorage may be obtained by vessels with local knowledge in the bay south-eastward of Tagbilaran. Flats, which dry, extend about half a mile south-eastward of the causeway connecting Panglao island and Bohol; nearly in the middle of the bay, about 6 cables south-eastward of the bridge in the middle of the causeway, is a pinnacle rock, with a depth of 3 feet ($0^{m}9$) over it. Large vessels should anchor, in a depth of 19 or 20 fathoms ($34^{m}7$ or $36^{m}6$), with Tagbilaran church bearing 317° and Mount Biking, 248°, but care should be taken to avoid a pinnacle rock, with a depth of less than 6 feet ($1^{m}8$) over it, lying in the approach to this anchorage about 2¾ miles south-eastward of Tagbilaran church.

Off-lying islands and danger.—Light.—Balicasag (Balikasag) island, 4 miles south-westward of Tahuruc point, the south-western extremity of Panglao island, is low, flat, and fringed by a narrow, steep-to reef. It contains the ruins of an old fort and a few houses. The channel between the island and the reef extending from the south-western end of Panglao island is about 1¾ miles wide and deep.

A light is exhibited, at an elevation of 70 feet ($21^{m}3$), from a square concrete tower, on Balicasag island.

Cervera shoal, with a least depth of 21 feet ($6^{m}4$) over it, coral and sand, and steep-to, lies 9½ miles eastward of Balicasag island; it is usually marked by tide-rips and by discoloration.

Pamilacan (Pamilakan) island, 50 feet ($15^{m}2$) high, lies about 14 miles eastward of Balicasag island, and is well cultivated. The northern extremity is clear of dangers and steep-to, but the remainder of the coast is fringed by a reef, which, in places, extends 2 cables offshore. There is a small rock with some bushes on it lying nearly one cable from its south-eastern side, and there is a fort in ruins on the northern point.

Charts 3809, 3810.

Southern side of Bohol.—Coast.—Lights.—From Tagbilaran to Nauco (Nauko) point, about 32 miles eastward, the coastal reef extends from one to 3 cables offshore, and is very steep-to; it is usually plainly marked by discoloration. There are no off-lying dangers. There are three prominent elevations: the round-topped hill, 475 feet ($144^{m}8$) high, about half a mile inland and 1¾ miles eastward of Tagbilaran church; Tayong peak, 1,659 feet ($505^{m}7$) high and conical, situated amongst a group of mountains 3 miles northward of Tayong village, situated about 13 miles eastward of Tagbilaran; and Mount Gorda, 1,076 feet ($328^{m}0$) high, about 3 cables northward of Gorda point,

Charts 943, 1263.

Charts 3809, 3810.

about 11 miles farther eastward. The rivers, with the exception of the Loay (Loai), which discharges 9½ miles east-south-eastward of Tagbilaran church, are small and of no value to shipping.

Chart 3827.

The town of Baclayon (Baklayon), about 3½ miles east-south-eastward of Tagbilaran, contains a large church and other buildings which are prominent. There is a small pier.

A light is exhibited, at an elevation of 40 feet ($12^{m}2$), from a concrete column, from the head of the pier at Baclayon.

The town of Loay (*Lat. 9° 36′ N., Long. 124° 00′ E.*), situated on the eastern side of the entrance to the river of the same name on low flat ground, owes its commercial importance to its harbour and partly to the river. Loay river is here about three-quarters of a cable wide and has two good piers. There was a least depth of 10 feet ($3^{m}0$) on the bar in 1938. The entrance is very narrow, but it is marked by beacons. There is regular steamer communication with Cebu, and occasionally with other ports.

A light is exhibited, at an elevation of 32 feet ($9^{m}8$), from a white concrete tower, on the eastern side of the entrance to Loay river.

Chart 3810.

The churches at the towns of Albuquerque, about 2½ miles eastward of Baclayon, Loay, Lila, 5¼ miles eastward of Loay, Dimiao and Garcia Hernandez, about 4 and 12 miles, respectively, eastward of Lila, are good marks along this coast.

Ch 3827.

Anchorages.—Temporary anchorage may be obtained by vessels with local knowledge outside the bar of Loay river, in depths of from 8 to 15 fathoms ($14^{m}6$ to $27^{m}4$).

Chart 3810.

Temporary anchorage may also be obtained by small craft in the small bight about half a mile westward of the town of Dimiao, fairly sheltered from all winds except from south-west; off the town of Valencia, about 2½ miles eastward of Dimiao, in depths of from 8 to 10 fathoms ($14^{m}6$ to $18^{m}3$), sand; and off the town of Garcia Hernandez, in depths of from 6 to 15 fathoms ($11^{m}0$ to $27^{m}4$), sand. These temporary anchorages are usually indicated by fish traps extending some distance offshore.

Coast.—Light.—Mount Gorda is a narrow steep ridge; its sides are wooded and it shows up distinctly against the range farther inland. Canopao (Kanopao) point, 6½ miles east-north-eastward of Gorda point, and Cantagay point, about three-quarters of a mile north-north-eastward of Canopao point, are bluffs, from 30 to 50 feet ($9^{m}1$ to $15^{m}2$) high, and there is a small bay between them.

Jagna bay is entered between Cantagay point and Nauco point, about 2¼ miles north-eastward. The shore northward of Cantagay point is fringed with a reef, which dries, leaving an anchorage area about a quarter of a mile wide, in which vessels with local knowledge may anchor, in depths of from 14 to 18 fathoms ($25^{m}6$ to $32^{m}9$), protected from south, through west and north, to north-east. Nauco point is clear of dangers and steep-to, and rises almost vertically to an elevation of 75 feet ($22^{m}9$), then gradually to over 100 feet ($30^{m}5$), within three-quarters of a cable of its extremity. There is a concrete pier, 200 feet ($61^{m}0$) long at its face, with a depth of 26 feet ($7^{m}9$)

Charts 943, 1263.

Chart 3810.

at its head, at the town of Jagna (Hagna), on the northern side of the bay.

A light is exhibited, at an elevation of 35 feet (10^m7), from a white concrete tower, on the inner end of the pier at Jagna.

Chart 3825.

Coast.—Fairly good anchorage may be obtained by vessels with local knowledge, in a depth of 15 fathoms (27^m4), eastward of the church at the town of Duero, about 3¼ miles northward of Nauco point, and about 2 cables offshore.

Guindulman bay is 4 miles wide at its entrance between Cabantian (Kabantian) point (*Lat. 9° 43′ N., Long. 124° 27′ E.*), situated 2½ miles east-north-eastward af Duero, and Napacao point, 4 miles eastward. There are considerable depths in the entrance, but they shoal rapidly towards the head; the shores are fringed by a narrow, steep-to reef. The only detached danger in the bay is a shoal, with a depth of 3 feet (0^m9) over it, in the north-eastern corner, about a quarter of a mile off the mouth of the Tabahan river. The town of Guindulman is situated at the head of the bay on the western side of the mouth of Tabahan river. Most of the town is hidden by coconut trees, and, although the tower of the church can be seen above them, it is inconspicuous. There is occasional steamer communication with Cebu and Jagna.

Eastward of a line joining the town of Guindulman and the village of Cogton (Kogton), about 5 miles north-north-eastward, there is a peninsula with densely wooded hills, having the appearance from southward of a flat ridge, about 1,100 feet (335^m3) high.

Good anchorage may be obtained by vessels with local knowledge outside the fish traps which line the shore in front of Guindulman, according to draught. The bottom is mud and sand.

Anda is a small town on a sandy point about one mile northward of Quinali (Kinali) point, situated 3½ miles eastward of Napacao point; it contains a large white, prominent church. Between the point on which the town stands and the mainland is an extensive mangrove swamp. Agio point, the south-eastern extremity of Bohol, is low but rises steeply to an elevation of 535 feet (163^m1), within less than half a mile of its extremity. It is fringed with a narrow, steep-to reef, with scattered mangroves.

Eastern side of Bohol.—Coast.—Between Agio point and Lamanoc (Lamanok) point, 2¾ miles northward, there is a bight filled with reefs and scattered mangroves. Lamanoc point is composed of low, rocky cliffs. Three rocks above water lie on the narrow reef fringing the point. Mount Pugatin, which has two peaks, 1,230 and 1,280 feet (374^m9 and 390^m1) high, lies with the northern and higher peak about 2 miles south-westward of Lamanoc point.

Cogton (Kogton) bay, entered between Lamanoc point and Cabulao (Kabulao) point, 6½ miles northward, is nearly filled in its outer part with low islets covered with mangroves. Lumislis islet is connected by a reef, which dries, to the northern shore, and there are three islets connected by reefs, which dry, to the southern shore. The shores of the bay are generally bordered with mangroves. A reef, awash, 6 cables southward of Lumislis islet, is the only detached danger in the bay. The head of the bay is filled with mud, and sand flats and reefs which dry fringe the shore. The town of Mabini and Cogton village are situated near the head of the bay, on the northern and southern sides,

Charts 943, 1263.

Chart 3825.

respectively. About 5½ miles westward of Mabini is Mount Batuanan, 1,118 feet (340^{m}8) high, the eastern termination of a long ridge running east and west, which descends abruptly as a cliff, and is a good landmark.

Good anchorage, sheltered from all winds except from south-east, may be obtained by vessels with local knowledge southward and south-westward of Lumislis islet, where there is a depth of 10 fathoms (18^{m}3), mud, shoaling to 2½ fathoms (4^{m}6).

Off-lying dangers.—From a position about 1¼ miles northward of Lamanoc point (*Lat. 9° 48′ N., Long. 124° 36′ E.*) a chain of reefs, with depths of less than 5 fathoms (9^{m}1) over them, extends about 5 miles northward ; a rock, awash, lies about 5¼ miles northward of the point ; vessels with local knowledge may cross the chain at several places.

Coast.—Dangers.—Cabulao (Kabulao) bay is entered between Cabulao point and Huagdon point, about 4 miles northward. Both the bay and its approaches are encumbered with reefs, and the shores of the bay are fringed with mangroves. Cabulao point is a bold, wooded promontory, rising to an elevation of 475 feet (144^{m}8), a quarter of a mile from its extremity. Its eastern end is steep-to, but its northern and southern sides are fringed with reefs, which gradually widen as the bay is entered. Huagdon point is the south-eastern extremity of a peninsula, 445 feet (135^{m}6) high, the eastern side of which is steep-to.

Tintiman island, 138 feet (42^{m}1) high, lies three-quarters of a mile southward of Huagdon point ; its sides are fringed with reefs, which, from the southern end, extend about 2 cables. A rock, awash, lies about 3 cables westward of its northern extremity. Limaiog (Limaiag) reef, on which there is a single bush, dries, and lies one mile southward of Tintiman island. A 9-foot (2^{m}7) patch lies about one mile north-north-eastward of Cabulao point, and an extensive reef, part of which dries, lies about 1¾ miles north-eastward of the same point.

Good anchorage may be obtained by vessels with local knowledge westward of Tintiman island, in a depth of 8 fathoms (14^{m}6), mud, about 3½ cables from the island.

Coast.—Between the northern extremity of the peninsula of which Huagdon point is the south-eastern extremity, and the eastern entrance to Basiao channel, about 3 miles north-north-westward, the coast is low and fringed with mangroves.

Basiao channel has been described on page 468.

Off-lying dangers.—About 3½ miles eastward of Huagdon point are several reefs, with depths of from 19 to 36 feet (5^{m}8 to 11^{m}0) over them. There are several detached shoals lying within 2 miles of the coast between Huagdon point and the entrance to Basiao channel ; the outer shoal, with a depth of 28 feet (8^{m}5) over it, lies 3½ miles north-north-eastward of Huagdon point, and a rock, awash, lies about midway between this shoal and the coast.

Chart 3827.

SIQUIJOR ISLAND.—Siquijor (Sikihor) island, about 10 miles eastward of the southern part of Negros, is a sub-province of Oriental Negros. Mount Malabahoc (Malabahok), near the centre of the island, is 2,060 feet (627^{m}9) high, and Mount Cudtingan (Kudtingan), about 3¾ miles north-eastward of Mount Malabahoc, is 1,530 feet (466^{m}3) high. The island is one of the most densely populated of the Philip-

Charts 3810, 943, 1263.

Chart 3827.

pines. The products are corn, hemp, tobacco, and cocoa. There are several towns and villages on its coast, but they are of little commercial importance.

The entire island is fringed by a narrow, steep-to reef, off which the depths are generally too great to afford anchorage. Except for the western end of the island, where the fringing reef extends nearly one mile offshore, the coast is clear of dangers.

Sandugan point (*Lat. 9° 18′ N., Long. 123° 36′ E.*), the northern extremity of the island, is low, but rises gradually to a hill, 540 feet ($164^{m}6$) high, about 1½ miles south-south-eastward of it. It is fringed by a reef, which dries, and is steep-to, extending 1¼ cables offshore.

Chart 3407, plan of Port Kanoan.

Port Canoan.—Lights.—Port Canoan (Kanoan), the only harbour of refuge in the island, is a narrow indentation in the northern side, about 3 miles south-south-westward of Sandugan point. Mud flats at the head of the port and fringing reefs on either side reduce the available anchorage space to about 2 cables in length and one cable in width. Both sides of the entrance are marked by low, yellow bluffs, and the fringing reefs extend about one cable offshore from the northern side and about half a cable from the southern side.

The town of Larena (Kanoan) stands on a slight elevation on the south-western side of the port. A stone pier, with a hut on it, extends north-north-westward from the foot of the bluff in front of the town. In 1938, there was a depth of 18 feet ($5^{m}5$) alongside the pier. Water is laid on to the pier.

Two leading lights lead into the port. The front light is exhibited from a triangular beacon, point up, painted white with a black vertical stripe in the centre, situated just northward of the bridge at the head of the harbour. The rear light is exhibited from a triangular beacon, point down, painted in the same manner as the front beacon, situated on a bare slope, 195 feet ($59^{m}4$) high, about 4¼ cables east-south-eastward of the front light.

Anchorage.—Directions.—To enter, keep the leading beacons, or lights in line, bearing 115°, anchoring on the leading line in a depth of 9 fathoms ($16^{m}5$), mud, with the head of the pier bearing 181°.

It is reported that bad weather from any direction sends a moderate sea into Port Canoan.

Chart 3827.

Coast.—The town of Siquijor (Sikihor), the largest on the island, stands about 5 miles west-south-westward of Port Canoan. It contains a church and other prominent buildings, painted white and all with nipa roofs. Tonga and Tambisan points, forming the western end of the island, are low, wooded, and fringed by a reef which partly dries, extending nearly one mile offshore. This reef shows well, and its edge is usually well defined by fish traps.

The town of San Juan, which contains a prominent church, is situated 3 miles south-eastward of Tambisan point, the western extremity of the island. The coast in front of the town is fringed by a narrow, steep-to reef. Lazi bay, on the southern side of the island, is entered on the eastern side of Canaba (Kanaba) point, about 4 miles eastward of Cambalaguio (Kambalaguio) point, situated about 5½ miles south-eastward of San Juan. Carigan point, the eastern entrance point of the bay, about 2¼ miles east-north-eastward of Canaba point (*Lat.*

Charts 3809, 943, 1263.

Chart 3827.

9° 06′ N., Long. 123° 37′ E.), is the extremity of a prominent tableland, over 400 feet ($121^{m}9$) high. The town of Lazi, in which there is a prominent church, stands on an elevation at the head of Lazi bay. Except for the narrow reef which fringes the shores of the bay, there are no dangers. There is a pier, with a depth of 10 feet ($3^{m}0$) alongside its western face.

Anchorage may be obtained by vessels with local knowledge, well protected during the North-east monsoon, in depths of from 18 to 20 fathoms ($32^{m}9$ to $36^{m}6$), mud and sand, with Lazi church bearing 317°. Inshore of this position the depths decrease rapidly.

Minalulan bay, close eastward of Lazi bay, is small and encumbered with reefs. The point forming the eastern side of the bay is moderately high and well wooded. Minalulan point, the south-eastern extremity of Siquijor island, is moderately high, wooded, and very prominent.

Maria bay, entered between Minalulan point and Daquit (Dakit) point, about 4¼ miles northward, is free from dangers except for the reef which fringes its shores. The town of Maria stands at the head of the bay on the northern side of a river which discharges there; it contains a prominent church. Anchorage, well protected during the South-west monsoon, may be obtained by vessels with local knowledge off the sand beach just southward of the river, in a depth of 20 fathoms ($36^{m}6$), sand. There is no coral off this beach, but immediately northward of the bluffs on the northern side of the mouth of the river, coral reefs extend about 1¼ cables offshore. Daquit point is over 200 feet ($61^{m}0$) high about half a mile within its extremity, whence it slopes gradually towards the sea, terminating in low, rocky bluffs. There is a rock above water lying close off the point, to which it is connected by a reef.

Enrique Villanueva (Talingting) village, in which there is a prominent church, is situated 4¼ miles north-north-westward of Daquit point. The coast in front of the village is fringed by a narrow steep-to reef.

Off-lying danger and bank.—Daquit (Dakit) shoal, a coral reef, with a depth of 9 feet ($2^{m}7$) over it, and steep-to, lies 2½ miles northward of Daquit point, and 2 miles offshore. It is usually marked by discoloured water.

A bank, with a least depth of 18 fathoms ($32^{m}9$) over it, was reported, in 1946, to lie about 10 miles southward of Minalulan point.

Chart 3825.

WESTERN SIDE OF LEYTE.—The western coast of Leyte northward of Ormoc bay has been described on page 408.

Ormoc bay.—Light.—Ormoc (Ormok) bay is entered eastward of Calunangan point; it is deep and free from dangers, the narrow reefs which fringe the shore being steep-to. Except off the delta of Bao river, on the western side of the head of the bay and in the bight of Port Bello just southward of it, the shores may be approached to a distance of about 3½ cables. The town of Ormoc (Ormok), situated at the head of the bay on the eastern side, is the largest town on the western side of Leyte, and is a place of some commercial importance. There is a concrete pier, which had, in 1938, a depth of 16 feet ($4^{m}9$) at its head. Water is laid on to the pier.

A light is exhibited, at an elevation of 30 feet ($9^{m}1$), from a white concrete pillar, near the beach at Ormoc.

Charts 3809, 3810, 943, 1263.

Chart 3825.

Anchorages.—Anchorage may be obtained all around the shores of Ormoc bay, in depths of from 8 to 15 fathoms (14^{m}6 to 27^{m}4), with good holding ground. The usual anchorage off Ormoc is about 3 or 3½ cables offshore, in a depth of 15 fathoms (27^{m}4), hard bottom, inshore of this the depths decrease rapidly.

Anchorage may be obtained by vessels with local knowledge in Port Bello during the South-west monsoon, in depths of from 9 to 12 fathoms (16^{m}5 to 21^{m}9), mud. The village of Biasong (*Lat. 10° 59′ N., Long. 124° 32′ E.*) is situated at the head of the port.

Coast.—Light.—Dangers.—From Ormoc to the town of Baybay, 22½ miles south-south-eastward, the coast is low and consists of steep beaches of cobblestone and small boulders, and is steep-to. Near the coast are densely wooded hills, from about 1,000 to 2,000 feet (304^{m}8 to 609^{m}6) high, and farther inland is a mountain range, from about 3,000 to 4,000 feet (914^{m}4 to 1,219^{m}2) high, running parallel with the coast.

There is a prominent chimney on the southern side of Panalian point, about 1¾ miles south-south-eastward of the light-structure at Ormoc. The chimney is white with two black bands at the top. There is a small pier here with a depth of 5 feet (1^{m}5) alongside.

The town of Baybay, in which the church is a good mark, stands on the southern side of the entrance to Pangbaganan river. There is a wooden pier, with a depth of 13 feet (4^{m}0) at its head. Water is laid on to the pier.

A light is exhibited, at an elevation of 35 feet (10^{m}7), from a white concrete tower, situated on the beach at Baybay.

Anchorage may be obtained by vessels with local knowledge, protected from all winds, except from the westward, in depths of from 12 to 15 fathoms (21^{m}9 to 27^{m}4), mud, about half a mile westward of Baybay.

Between Baybay and Catarman (Katarman) point, 2½ miles south-westward, the coast forms a bay, on the southern side of which is Punpungan village. A prominent hill, 316 feet (96^{m}3) high, lies on the eastern side of the bay, about half a mile inland. Catarman point is fringed by a reef which extends nearly half a mile north-north-westward from it, and a reef, with a depth of one fathom (1^{m}8) over it, lies three-quarters of a mile north-north-eastward of the point.

Good anchorage may be obtained by vessels with local knowledge inside the one-fathom (1^{m}8) reef, and also off Punpungan village, in depths of from 6 to 10 fathoms (11^{m}0 to 18^{m}3), mud.

From Catarman point to Guadalupe village, 6 miles southward, the coast consists of a coarse gravel beach, which is steep-to, backed by hills, from about 650 to 2,600 feet (198^{m}1 to 792^{m}5) high. A reef, with a depth of 9 feet (2^{m}7) over it, lies about three-quarters of a mile west-south-westward of Guadalupe village, and a reef, which dries, lies about one mile south-westward of the same village and about half a mile offshore. Inopacan (Inopakan) is a small town, 3 miles south-south-westward of Guadalupe.

Amogotada point, 10 miles south-south-westward of Catarman point, is low, fringed with mangroves, and covered with coconut trees. A reef extends about 4 cables from the northern side of the point, and is steep-to. Mount Bontoc (Bontok), about 1½ miles south-south-eastward of Amogotada point, is very prominent and steep, 665 feet

Charts 3808, 3810, 943, 1263.

Chart 3825.

($202^{\mathrm{m}}7$) high, with a flat top. When first seen from northward it appears as an island, and is liable to be mistaken for the point.

Off-lying islands.—Cuatro islands are a group of four islands lying westward and north-westward of Amogotada point (*Lat. 10° 29′ N., Long. 124° 43′ E.*), with deep channels, clear of dangers between the islands and between them and the coast of Leyte. Himuquitan (Himukitan), the southernmost and largest, is 328 feet ($100^{\mathrm{m}}0$) high, and prominent, lying about 2½ miles westward of the point; it is fringed by a narrow steep-to, coral reef. Apit island, 1½ miles northward of Himuquitan island, is 150 feet ($45^{\mathrm{m}}7$) high, and fringed by a narrow reef. Mahaba island, about 2 miles north-westward of Apit island, is 137 feet ($41^{\mathrm{m}}8$) high, and fringed by a reef, which, from the southern side, extends nearly half a mile. Daquio (Dakio) island, about 1½ miles north-north-westward of Apit island, is sandy and 40 feet ($12^{\mathrm{m}}2$) high to the tops of the trees; it is fringed by a reef, which, from the north-western end, extends about 3½ cables.

Coast.—Along the coast between Amogotada point and Binobolang point, about 4½ miles southward, and thence to Green point, the south-western extremity of Leyte, the depths increase more gradually offshore.

Anchorage may be obtained by vessels with local knowledge off the town of Hindang, 3 miles southward of Amogotada point, about half a mile offshore, in depths of from 7 to 10 fathoms ($12^{\mathrm{m}}8$ to $18^{\mathrm{m}}3$), with Hindang church bearing 141°. The coastal reef extends about 3 cables offshore in this vicinity.

The small towns of Hilongos, Bato, Matalom and Cajagnaan (Kahagnaan) are situated on the coast between Binobolang point and Green point.

Canigao channel. — Light. — Dangers. — Buoys. — Canigao (Kanigao) channel, between the eastern end of Danajon bank (page 469) and the coast of Leyte, about 6½ miles eastward, is encumbered by Canigao (Kanigao) island and several detached reefs. The passage between Canigao island and Leyte is about one mile wide, deep in the fairway, and is the one generally used.

Canigao island, 5½ miles northward of Green point, is low, flat, and densely wooded. The northern, western, and southern sides are fringed with reefs, which extend about 6½ cables south-south-westward from the southern side.

A light is exhibited, at an elevation of 88 feet ($26^{\mathrm{m}}8$), from a white steel framework tower, on the north-eastern point of Canigao island.

Cain reef, with a least depth of 4 fathoms ($7^{\mathrm{m}}3$) over it, lies 1¾ miles west-north-westward of Canigao island.

Adam reef, with a least depth of about one foot ($0^{\mathrm{m}}3$) over it, lies about 2½ miles westward of Canigao island. Between this reef and the eastern extremity of Danajon bank there is a channel about 2 miles wide, with depths of over 5 fathoms ($9^{\mathrm{m}}1$) and a least depth of 6 fathoms ($11^{\mathrm{m}}0$) in the fairway.

A black can buoy marks the eastern extremity of Danajon bank and a red conical buoy is moored close eastward of Adam reef.

Eve reef, with a least depth of 19 feet ($5^{\mathrm{m}}8$) over it, lies about 1½ miles west-south-westward of Canigao island.

Abel reef, with a least depth of 22 feet ($6^{\mathrm{m}}7$) over it, lies about 1¾ miles southward of Canigao island, and about 1¼ miles from the coast of Leyte.

Charts 3810, 943, 1263.

Chart 3825.

SOUTHERN SIDE OF LEYTE.—Coast.—Light.—Between Green point and Taancan (Taankan) point, the southern extremity of Leyte, the coast consists of rocky points between which are sandy beaches, off which the depths are too great to afford anchorage.

Maasin (*Lat. 10° 08′ N., Long. 124° 50′ E.*) is a small town with a sandy beach, from which a coral reef, which dries, extends about 2 cables southward, situated about 5 miles east-south-eastward of Green point.

A light is exhibited, at an elevation of 35 feet (10^{m}7), from a concrete beacon, at the boat landing pier at Maasin. In 1938, there was a depth of 19 feet (5^{m}8) at the head of the pier.

Good anchorage may be obtained by vessels with local knowledge off the eastern end of this reef, in depths of 5 or 6 fathoms (9^{m}1 or 11^{m}0) with the light-structure bearing 328°. Small craft can anchor closer in, off the north-eastern point of the reef, in depths of from 3 to 4 fathoms (5^{m}5 to 7^{m}3), sticky bottom. Maasin is connected to the general telegraph system.

Amparo point lies 4½ miles south-eastward of Maasin, and about 2½ miles farther south-eastward is the town of Macrohon (Makrohon). Taancan point is low and formed of rock underworn by the sea; it is the southern termination of a low, wooded peninsula, the northern part of which is formed by a mangrove swamp, through which there is a passage known as the Santa Sophia canal, used by native craft at high water. Taancan point is fringed by a narrow, steep-to reef.

Chart 3826.

Off-lying island.—Limasawa island, about 3 miles south-eastward of Taancan point, with a deep channel between, is 719 feet (219^{m}1) high in the northern part, and well wooded. It is fringed by a narrow, steep-to reef, off which the depths are too great to afford anchorage for large vessels. The only detached danger is a coral reef, with a depth of 28 feet (8^{m}5) over it, lying about 1¼ cables from the eastern side, about 1¼ miles northward of the southern extremity of the island. The western part of the island is well populated and the land is cultivated. On the western side are the villages of San Bernardo and Triana, while on the eastern side is San Miguel.

The tidal streams set north-westward and south-eastward at a considerable rate, off Limasawa island.

Sogod bay.—Light.—Sogod bay, entered between Taancan point and Ilijan (Ilihan) point, about 7½ miles north-eastward, is deep, free from danger, and contains no good harbour. The shores are clear and so steep-to that there are few places where anchorage with sufficient swinging room, except for the smallest vessels, may be obtained. Hemp is the principal product of this locality.

Malitbog is a small town on the western shore of Sogod bay, about 9½ miles northward of Taancan point. There is a pier, with a depth of 12 feet (3^{m}7) at its head, and there are two hauling off buoys. Water is laid on to the pier.

A light is exhibited, at an elevation of 35 feet (10^{m}7), from a white concrete tower near the root of the pier at Malitbog. The light-tower was reported, in 1949, to be difficult to distinguish. The best anchorage for vessels with local knowledge is close northward of the pier, in a depth of 15 fathoms (27^{m}4), hard sand.

There is regular steamer communication with Cebu.

Charts 3810, 943, 1263.

Chart 3826.

Anchorage may be obtained by vessels with local knowledge in a bight just northward of the village of Banday (Bandai), about 9½ miles northward of Malitbog, in a depth of 17 fathoms (31^m1), sand and coral. Immediately northward of Bontoc village, situated about 2¾ miles northward of Banday, there is a bight in which small craft can take refuge in typhoon weather.

The villages of Sogod and Consolacion (*Lat. 10° 23′ N., Long. 125° 00′ E.*) stand at the head of the bay. There is a pier, with a depth of 30 feet (9^m1) alongside, at Sogod. Anchorage may be obtained by vessels with local knowledge, in a depth of 35 fathoms (64^m0), mud, about 3 cables from the head of the pier. On the eastern side of the bay are the villages of Labao, on Labao point, situated 12¾ miles north-north-westward of Ilijan point, and Libagon, 2¼ miles farther northward, which is a regular port of call for the coasting vessels.

Panaon island.—Panaon island is separated from the south-eastern point of Leyte by Panaon strait. The island is mountainous and is divided throughout its length by a range of hills, attaining near the centre an elevation of 2,857 feet (870^m8), and terminating southward in Mount Nelangcapan (Nelangkapan), a peak, 2,354 feet (717^m5) high, the slopes of which form Binit point, the southern extremity of the island. The entire coast of the island is clear of dangers and steep-to; with the exception of Liloan bay there are no good anchorages.

Caligangan (Kaligangan) point, 5¼ miles south-eastward of the northern extremity of Panaon island, rises to an elevation of 790 feet (240^m8), about 6 cables southward. About 9 miles south-eastward is Caniguin (Kaniguin) point, and 4¼ miles farther south-south-eastward is Bolobolo point.

Panaon strait has a width of nearly half a cable at its narrowest part, where the depth near the middle is about 6 fathoms (11^m0), but a bank extends here about 60 yards (54^m9) from the southern shore, with a depth of 3 fathoms (5^m5) at its outer edge. About a quarter of a mile eastward of the narrowest part, about mid-channel, there is a depth of only 1½ fathoms (2^m7). Vessels usually pass southward of this bank to avoid the stronger stream and whirlpools on the northern side. The only danger in the western entrance is a detached rocky shoal, with a least depth of 11 feet (3^m4) over it, and steep-to, situated 3½ cables westward of the northern extremity of Panaon island. Vessels should pass southward of this shoal as foul ground lies between it and the coast of Leyte.

The tidal streams in Panoan strait run at a rate of from 3 to 4 knots at springs; there are strong eddies and whirlpools in either entrance.

Liloan bay.—**Light.**—Liloan bay is situated at the north-western end of Panoan island, at the western entrance to Panoan strait. The town of Liloan (*Lat. 10° 10′ N., Long. 125° 07′ E.*) stands at the head of the bay. A reef extends about half a cable northward and north-eastward from the western entrance point of the bay, and the shores of the bay are fringed by reefs, which, from the head, extend about three-quarters of a cable.

There is a pier, with a depth of 17 feet (5^m2) alongside. Water is laid on to the pier.

A light is exhibited, at an elevation of 29 feet (8^m8), from a white

Charts 3810, 943, 1263.

Chart 3826.

wooden framework structure, on the extremity of the western entrance point of Liloan bay.

Good anchorage may be obtained by vessels with local knowledge, in a depth of 7 fathoms (12ᵐ8), sand and coral, about 1¼ cables north-eastward of the church, which is situated about 2½ cables southward of the light-structure.

Charts 3827, 3811, 3810.

MINDANAO SEA.—Mindanao sea is bounded on the north by the southern coasts of Negros, Bohol and Leyte, and on the south by the northern coast of Mindanao. This sea, with Surigao strait at its eastern end, forms a passage between the Sulu sea and the Pacific ocean.

Current.—Tidal streams.—In Mindanao sea, between the southern extremity of Panaon island and the northern extremity of Camiguin (Kamigin) island (page 494) there is a constant westerly current, with a varying rate according to the wind and tidal stream, in both monsoons. Vessels approaching Surigao strait from westward should keep well over towards Panaon island to avoid being set towards Camiguin island. In the southern part of the sea the tidal stream appears to be very weak, and the currents follow the direction of the wind in both monsoons. There appears to be a constant southerly current between Cebu and Bohol, and between Negros and Siquijor island.

The stream produced by the tidal wave that enters by Surigao strait and passes between the islands of Panglao and Siquijor divides into two branches. The northern flows north-westward, and, striking the south-eastern coast of Cebu in the vicinity of Dalaguete point, spreads northward and southward along that coast. The north-going stream passes through Bohol strait, and at 5 or 6 miles southward of the Camotes islands meets the south-going stream which has passed between the northern part of Cebu and Leyte. The other branch flows westward, and, striking the coast of Negros at Dumaguete, divides into two other arms, one of which enters Tañon strait at a considerable rate, while the other flows southward between the coast of Negros and Siquijor island until, off Bonbonon point, it meets the east-going stream around the southern end of Negros, and the united waters take a south-easterly direction towards Tagolo and Silla points in Mindanao.

Chart 3827.

NORTHERN SIDE OF MINDANAO.—Coast.—Tagolo point, the northern extremity of the western part of Mindanao, has been described on page 246.

Off-lying island.—Light.—Silino island (*Lat. 8° 51′ N., Long. 123° 25′ E.*), 7¾ miles northward of Tagolo point, is low, flat, and wooded, with sandy coasts bordered by a narrow, steep-to reef, which, from its western side, extends a quarter of a mile.

A light is exhibited, at an elevation of 42 feet (12ᵐ8), from a tower, situated on the northern extremity of Silino island. It was reported, in 1950, to be obscured by trees when bearing about 275°.

Coast.—Between Tagolo point and Silla point, 7½ miles east-south-eastward, the coast is composed of low, even coral cliffs. The head of the bight westward of Silla point is fringed by a wide coral reef,

Charts 3809, 3811, 943, 1263.

Chart 3827.

through which is a passage to Cavite village on the western shore. Silla point, which may be identified by Mount Silla, about three-quarters of a mile southward, is fringed by a reef which extends less than a quarter of a mile offshore.

Chart 3407.

Murcielagos bay. — Dangers. — Buoys. — Beacons. — Murcielagos bay, entered between Silla point and Bulalo (Bulato) point, 5½ miles east-south-eastward, is encumbered with numerous coral reefs and shoals, through which are several channels where small vessels may obtain a sheltered anchorage. The western and southern shores are hilly, rising gradually to the mountains inland. Mount Silla, 960 feet ($292^{m}6$) high, is the most prominent landmark; bare vertical cliffs rise from the 500-foot ($152^{m}4$) level in a sharp peak, and with the adjacent hill northward, takes the shape of a saddle.

Talulue (Talukluk) channel, in the western part of the bay, leads to an anchorage near the northern end of Sinipay Daco (Sinipai Dako) island. A branch channel leads towards Pinahon (Sipina) islet, 4 cables east-north-eastward of the eastern point of Sinipay Daco island; these channels are deep.

Cabgan (Kabugan) islands are connected with Bulalo point and the shore south-westward of it by a reef which dries. A bank, with depths of from one foot to 3 fathoms ($0^{m}3$ to $5^{m}5$) over it, extends three-quarters of a mile westward from Murcielagos, the largest island, the western edge being marked by No. 1 black can buoy.

A 4¾-fathom ($8^{m}7$) patch and a 2½-fathom ($4^{m}6$) patch lie about half a mile and one mile, respectively, westward of the western extremity of Murcielagos island. A shoal, with a least depth of 1¾ fathoms ($3^{m}2$) over it, lies about 1¾ miles west-north-westward of the same point, and a 3¼-fathom ($5^{m}9$) patch lies about 2 cables farther westward. There is a clear channel, about half a mile wide, between these shoals and those which encumber the bay.

Baliangao bay, with the town of the same name at its head, lies at the eastern end of Murcielagos bay. The channel of approach to the anchorage off the town is marked by Nos. 1 and 3 black can buoys, and Nos. 2 and 4 red conical buoys, the positions of which may best be seen on the chart. It has a least width of about half a cable, and a least depth of 3 fathoms ($5^{m}5$) may be carried to the anchorage one cable south-westward of a beacon, situated on a shoal about 2 cables south-westward of the head of the pier at Baliangao. The pier can only be approached by small boats at high water. There is a pier, with a depth of 10 feet ($3^{m}0$) at its head, on Miray (Pulanglupa) point, on the northern side of Baliangao bay, about one mile westward of Baliangao. A bank extends about one cable southward from Miray point and narrows the channel to a width of about half a cable. A beacon stands close off Miray point.

Casul (Kasul) bay, in the south-eastern part of Murcielagos bay, is approached by a channel with a least width of about half a cable, and a least depth in the fairway of about 6 fathoms ($11^{m}0$). Naburos island, 261 feet ($79^{m}5$) high, lies on the western side of the entrance to Casul bay, and at the eastern edge of the reefs encumbering the centre part of Murcielagos bay. Naputhao (Mapotao) island lies 8½ cables southward of Naburos island (*Lat. 8° 37′ N., Long. 123° 34′ E.*).

Anchorages.—Directions.—A vessel proceeding to the anchorage

Charts 3809, 3811, 943, 1263.

Chart 3407.

off Sinipay Daco island should steer for Mount Canim (Kanen), about 4 miles south-south-westward of Silla point (*Lat. 8° 42′ N., Long. 123° 30′ E.*), bearing 232°, until Mount Silla bears 293°, to clear the bank extending eastward from Latungon point, situated about one mile south-south-eastward of Silla point; when Pinahon islet bears 160°, she should alter course southward to avoid a 2¾-fathom ($5^{m}0$) patch lying 8½ cables south-south-westward of Latungon point; when Taluluc (Talukluk) islet, situated about 2½ cables north-westward of the north-western point of Sinipay Daco island, bears 234°, she should steer for it on that bearing until the western extremity of Sinipay Daco island bears 207°; she should then steer 216°, which will lead to the anchorage with the northern point of the same island bearing 090°.

If intending to anchor off Pinahon islet, when it bears 160° she should steer for it on that bearing, and anchor in a depth of about 19 fathoms ($34^{m}7$), at a distance of one cable or more from it.

A vessel with local knowledge approaching the anchorage in Baliangao bay from northward or eastward, should steer 182° and pass about half a cable westward of No. 1 buoy; she should continue on this course for a distance of about 2 cables southward of the buoy, then alter course eastward and pass close south-westward of No. 3 buoy and northward of Nos. 2 and 4 buoys, and anchor when Miray point bears 000°, or proceed to the anchorage off the town of Baliangao. The edge of the reefs fringing the channel may readily be seen when the sea is smooth.

Anchorage may be obtained by vessels with local knowledge in Casul bay, north-eastward or eastward of Naputhao island. Vessels should pass about 80 yards ($73^{m}2$) eastward of the rounding points of Naburos island, and westward of the shoal with a depth of about 3 feet ($1^{m}2$) over it, situated half a mile south-south-eastward of Naburos island. On a clear day, with a smooth sea, the edge of the reefs bordering the channel may be easily seen.

Chart 3827.

Coast.—Between Bulalo point and Baliangao point, 2¼ miles eastward, the coast is fringed by a narrow, steep-to coral reef. Between Baliangao point and a point 2¾ miles east-south-eastward, there is a bight filled with reefs, through which there is a boat passage leading to a landing place for the town of Baliangao, 2 miles north-westward. The town of Plaridel, in which there are some prominent buildings, is situated 5¾ miles east-south-eastward of Baliangao point.

Usucan (Usukan) shoal, with a depth of 9 feet ($2^{m}7$) over it, lies about 6½ cables east-north-eastward of Usucan (Usukan) point, situated about 4 miles east-south-eastward of Baliangao point. Langaran shoal, with a depth of 2 fathoms ($3^{m}7$) over it, lies 1¾ miles east-south-eastward of Usucan point, and about 6 cables offshore.

Anchorage may be obtained by vessels with local knowledge during the South-west monsoon, in a depth of 10 fathoms ($18^{m}3$), with the bell tower of the church at Plaridel bearing 182°, about half a mile offshore. In approaching this anchorage care should be taken to avoid Usucan and Langaran shoals.

Chart 3426, plan of Port Langaran.

Inamucan bay. — Light. — Inamucan bay (Port Langaran) is entered between Inamucan (Inamukan) point (*Lat. 8° 37′ N., Long. 123° 44′ E.*), situated about 3 miles south-eastward of Usucan point, *Chart 3426, plan of Port Langaran.*

and Baubaon point, about half a mile farther eastward. A reef, which dries, extends about a quarter of a mile north-eastward and eastward from Inamucan point, and a reef extends about 1¾ cables north-westward from Baubaon point; these reefs reduce the navigable width of the entrance channel to about 1½ cables.

A light is exhibited from the edge of the reef extending from Inamucan point.

There are two piers, with depths of 13 and 16 feet ($4^{m}0$ and $4^{m}9$), respectively, at their head.

Anchorage.—Directions.—Anchorage may be obtained, in a depth of 10 fathoms ($18^{m}3$), soft mud, about 1½ cables eastward of the pier on the western side of Inamucan bay.

A vessel entering should steer 182°, and pass about 1½ cables westward of the western extremity of Baubaon point; when the buildings on the western shore bear 260°, she should steer about 250°, which will lead to the anchorage.

Chart 3827.

Coast.—Light.—Polo point, about 1½ miles south-eastward of Baubaon point, is fringed by a narrow, steep-to reef. The point is low and the land is flat for some distance inland, being a mangrove swamp, through which there is a passage at high water for small boats to Inamucan bay.

A light is exhibited, at an elevation of 60 feet ($18^{m}3$), from a white steel tower, on Polo point.

Off-lying danger.—Iligan reef, with a depth of 9 feet ($2^{m}7$) over it, coral and white sand, lies 7¾ miles east-north-eastward of Polo Point lighthouse.

Chart 3811.

Iligan bay.—Iligan bay, entered between Polo point and Initao point, about 33 miles eastward, is fringed on its western side by reefs, which at some points, lie within a distance of 1½ miles offshore, but its southern and eastern shores are mostly steep-to and safe.

Western side of Iligan bay.—Coast.—Light.—Buoys.—Near the shore on the western side of the bay the land is low, flat, and swampy, and interspersed with low-lying alluvial and sandy areas. At a distance of from one to 2 miles inland the foot-hills begin to rise gradually to the mountain range running parallel with the coast. These hills, for a distance of from 6 to 10 miles from the coast, are cultivated, about half the area being cleared; on the uncleared portion are many large trees. The mountains are heavily wooded, and the peaks appear to be very steep; the valleys are precipitous.

Polo bay, entered between Polo Point and Silanga point, about 2¾ miles south-south-eastward, is almost filled with reefs in which there are two openings, where sheltered anchorage may be obtained by vessels with local knowledge. The better anchorage of the two is about one mile southward of Polo Point lighthouse. Capayas (Kapayas) islet (*Lat. 8° 35′ N., Long. 123° 46′ E.*), of coral rock, lies on the coastal reef 1¼ miles south-south-eastward of the lighthouse. It has some bushes, about 5 feet ($1^{m}5$) high, on it.

Silanga islet, covered with trees, about 60 feet ($18^{m}3$) high, lies close offshore on the coastal reef, about half a mile south-eastward of Silanga point. The reef extends about 4 cables eastward from the islet.

Charts 3809, 943, 1263.

Chart 3811.

Between Silanga point and Layaban point, about 2½ miles south-south-eastward, the coast is fringed by a reef which extends about half a mile offshore. Layaban point is low, sandy, and bordered with coconut trees which grow so densely that the point has the appearance of a high bluff when seen from a distance. Paypayan (Papayan) bay, entered between Layaban point and Napolo point, about three-quarters of a mile southward, is fringed by a reef, which is awash, and extends from 2 to 4 cables offshore. Vessels with local knowledge may obtain anchorage about 3½ cables south-eastward of Layaban point, in a depth of 3½ fathoms ($6^{m}4$), but the anchorage space is very contracted ; anchorage may also be obtained in Loboc cove, an opening in the coastal reef about one mile south-eastward of Napolo point ; this anchorage is also very contracted, and vessels should moor head and stern, but it affords shelter in all but the heaviest weather.

Oroquieta, the largest and most important town on the shores of Iligan bay, stands about 1¾ miles south-eastward of Napolo point, on the north-western side of the entrance to Oroquieta river. It is easily identified by a large warehouse, visible from a considerable distance northward, and also by the church which stands 1¾ cables westward of the northern entrance point of the river. There is a depth of about 1½ feet ($0^{m}5$) on the bar of the river. There is regular steamer communication with Cebu.

There is a stone causeway and concrete pier extension extending about half a cable from the beach at Oroquieta ; it has a depth of 10 feet ($3^{m}0$) on its southern side and 27 feet ($8^{m}2$) on the northern side. Approach to the pier is through a narrow channel in the off-lying coral reef.

Anchorage, protected from southerly and westerly winds, with good holding ground, may be obtained by vessels with local knowledge, about a quarter of a mile offshore, with the church bearing 227°, in a depth of 12 fathoms ($21^{m}9$), mud. This anchorage should be cautiously approached as the bank is very steep. At times during the North-east monsoon this anchorage becomes untenable.

Simio point, about three-quarters of a mile south-eastward of the southern entrance point of the Oroquieta river, is low, sandy, covered with coconut trees, and fringed by a reef which extends about a quarter of a mile offshore. The village of San Vicente is situated about 1¼ miles south-south-westward of Simio point and three-quarters of a mile inland ; it is not visible from seaward, being concealed by trees. Anchorage may be obtained by vessels with local knowledge, in a depth of 4 fathoms ($7^{m}3$), just northward of the mouth of the San Vicente river, which discharges about one mile southward of Simio point.

Charts 3811, 3810.

Balaring point (*Lat. 8° 26′ N., Long. 123° 50′ E.*), about 3¼ miles south-south-eastward of Simio point, is sandy, bordered with mangroves and nipa palms, with a strip of coconut trees about half a cable within the point, and fringed by reefs which extend about a quarter of a mile offshore. For about 4 miles southward of Balaring point the coastal reef does not extend more than half a mile offshore, thence to Tabu point, 2½ miles farther southward, there are detached reefs lying as much as one mile offshore.

A rocky shoal, with a depth of 10 feet ($3^{m}0$) over it, lies one mile north-north-westward of Balaring point and about half a mile offshore.

Charts 943, 1263.

Charts 3811, 3810.

Aloran village, about 1¼ miles south-westward of Balaring point, is not visible from seaward. The landing place may be identified by a warehouse with a galvanised iron roof and several nipa huts. Anchorage may be obtained by vessels with local knowledge, in a depth of about 16 fathoms ($29^{m}3$), with the warehouse bearing 249°, distant about 3¾ cables. Mapaan point, about 2¾ miles southward of Balaring point, is low, sandy, covered with coconut trees and fringed by reefs which extend about half a mile offshore.

The town of Jimenez is situated 5¾ miles southward of Balaring point, and about one mile inland. It may be identified by a prominent white stone church with a square tower and a dome. Palilan river, the mouth of which is fronted by a very shallow bar, discharges about one mile north-north-westward of Tabu point. About a quarter of a mile southward of the entrance is a black iron warehouse close northward of which is the pier, which, in 1939, had a depth of 20 feet ($6^{m}1$) at its head. It was then reported that shoaling was taking place and that during the strength of the North-east monsoon a heavy swell sometimes reaches the pier.

The coast in the vicinity of Jimenez is fringed by a bank which extends as much as a quarter of a mile offshore. It is fronted by Poricos, Madre and other reefs which are mostly awash, and are usually well defined and easy to distinguish. Between these reefs and the coastal bank there is a good but contracted anchorage for vessels with local knowledge, in depths of from 4 to 6 fathoms ($7^{m}3$ to $11^{m}0$). Between the reefs there are several channels leading to the anchorage, the southern one being generally used.

The southern extremity of Poricos reef, and the southern extremity of the southernmost reef, situated half a mile south-eastward of Tabu point, are each marked by a red conical buoy. Tabu point is low, sandy, bordered with coconut trees, and steep-to.

A light is exhibited, at an elevation of 32 feet ($9^{m}8$), from a white concrete tower, on Tabu point.

A vessel approaching the anchorage off Jimenez by the southern channel should, from a position with the light-structure on Tabu point bearing 285°, distant 2 miles, steer 270°, which leads about 1¾ cables southward of the red conical buoy marking the edge of the southernmost reef southward of Madre reef; when the light-structure bears 340° she should alter course northward and pass from half to three-quarters of a cable eastward of the point and thence, after rounding the point, steer for the anchorage about 1¼ cables off the pier.

Coast.—Between Tabu point (*Lat. 8° 20′ N., Long. 123° 52′ E.*) and Balicaocao (Balikaokao) point, 5¾ miles southward, the coast forms a bay with a low shore of sand and mangroves, fringed in most places by coral. The villages of Sinakaban (Nakavan) and Tudela stand on the shores of the bay, about 2 and 5 miles, respectively, southward of Tabu point.

A chain of reefs, parts of which dry, extends from about one mile southward of Tabu point to within half a mile north-eastward of Balicaocao point. The outer edges of these reefs, which are steep-to, lie about 1½ miles offshore. Between these reefs and the coast, anchorage, well sheltered from the sea during the North-east monsoon, may be obtained by vessels with local knowledge, in depths of from 3 to 20 fathoms ($5^{m}5$ to $36^{m}6$), mud and sand. Access to this anchorage

Charts 943, 1263.

Charts 3811, 3810.

may be had through channels between the reefs lying eastward of it, or from the northward, care being taken to avoid a 1½-fathom ($2^{m}7$) patch lying in the middle of the northern entrance, about one mile southward of Tabu point.

Balicaocao point is sandy and bordered with coconut trees. A shoal with a depth of 1¾ fathoms ($3^{m}2$) over it, lies about half a mile south-eastward of the point.

Chart 3426.

Port Misamis. — Dangers. — Buoys. — Lights. — Port Misamis, at the head of which is Panguil bay, lies with its entrance between Loculan (Lokulan) point, situated 1¾ miles southward of Balicaocao point, and Binuni point, 9 miles eastward. The shores are low and fringed with mangroves, but northward of the town of Misamis, situated on the western shore about 3½ miles southward of Loculan point, there is an extended sandy beach, and southward of the town on the opposite shore there are high hills.

Loculan point is low and sandy, with the village of the same name close westward of it, and the river of that name discharging about 3 cables northward. Binuni point is low, wooded, and fringed by a coral reef which extends about 3½ cables offshore.

Loculan (Lokulan) shoals consist of two groups, lying from half a mile to 1¾ miles from the western shore midway between Loculan point and Opol point, about 2¼ miles southward; the western group consists of sand and rock, parts of which dry. Trunks of trees may often be seen on these shoals. The eastern group, with depths of from 3 feet to 2¼ fathoms ($0^{m}9$ to $4^{m}1$) over them, lies half a mile eastward of the western group, with a deep channel between. A red conical buoy, No. 2, marks the eastern side of the shoalest patch of this group. This buoy was reported missing in 1950.

Narvaez shoal, with a least depth of 1¾ fathoms ($3^{m}2$), coral, over it, lies about 3½ miles east-north-eastward of Opol point and about 1¼ miles from the south-eastern shore of the port.

Kulasihan (Kulasejang) shoal, with a least depth of 1½ fathoms ($2^{m}7$) over it, lies about 3 miles eastward of Opal point and about three-quarters of a mile from the south-eastern shore.

Panguilinan shoals are two small patches, each with a depth of 1¾ fathoms ($3^{m}2$) over it, lying about 2½ miles eastward of Opol point.

A bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends about 8½ cables north-eastward from the fort at Misamis, and detached shoals, with depths of from 2½ to 3 fathoms ($4^{m}6$ to $5^{m}5$) over them, lie within 3½ cables farther north-eastward and about 6½ cables from the western shore. The eastern edge of these shoals is marked by a red conical buoy, No. 4, but, in 1950, it was reported missing.

Pasil shoal, with depths of from about one foot to 3 fathoms ($0^{m}3$ to $5^{m}5$) over it, extends about 2¾ miles north-north-eastward from Palalagoya point, situated on the south-eastern shore, about 1¾ miles southward of the fort at Misamis. A black can buoy, No. 1, is moored on the northern edge of the shoal, about 3 miles north-north-eastward of Palalagoya point (*Lat. 8° 07′ N., Long. 123° 51′ E.*), but, in 1950, it was reported missing.

There is a Government pier, 300 feet ($91^{m}4$) long, with a depth, in 1950, of 17 feet ($5^{m}2$) alongside, at Misamis. Water is laid on to the pier.

Charts 3811, 943, 1263.

Chart 3426.

The town is connected to the general telegraph system. A submarine cable is landed near the east corner of the fort.

A light is exhibited from the south-western corner of the fort at Misamis.

Two leading lights are exhibited on Migcaniguing (Migkaniguing) point, the western entrance point of Kolambugan bay, situated on the south-eastern shore of the port, about 2 miles eastward of Palalagoya point. The front light is shown at an elevation of 65 feet ($19^{m}8$), from a triangular beacon, point up; the rear light is shown, at an elevation of 75 feet ($22^{m}9$), from a triangular beacon, point down. These lights in line, bearing 194°, lead in between the shoals to the anchorage off the pier at Migcaniguing point. The pier had, in 1938, a depth of 25 feet ($7^{m}6$) at its head.

Between Misamis and Panguil bay the navigable channel has depths of from 3 to 6 fathoms ($5^{m}5$ to $11^{m}0$) as far as Solaton island, about 6 miles south-westward, where the channel is 4 cables wide; about 3½ miles above this island, at the entrance to Panguil bay, the depths decrease to one fathom ($1^{m}8$) and less.

Pilots.—A pilot may be obtained from Cebu.

Anchorages.—Directions.—Anchorage may be obtained about half a mile eastward of Loculan point, in a depth of 6 fathoms ($11^{m}0$), fine sand.

Good anchorage may be obtained, in a depth of 4½ fathoms ($8^{m}2$), with Misamis fort bearing 036°, distant a quarter of a mile. Small vessels may anchor farther northward, about one cable southward of the head of the pier.

There are two channels leading into Port Misamis, of which the eastern is the wider and better, and is the one generally used.

As all the buoys marking the shoals are missing, vessels should not attempt to enter the port without local knowledge.

A vessel from eastward should keep a large isolated building with an iron roof, on the beach north-eastward of Misamis, in line with Bucagan hill, situated about 1¼ miles south-westward of the town, bearing 243°, until the church eastward of Migcaniguing point bears 192°, when she should steer 232° until abeam of Misamis point, and the Government pier in sight, when she may anchor in a depth of 5 fathoms ($9^{m}1$), eastward of some fish traps, where there is fairly good holding ground.

A vessel entering by the northern channel should pass about 3¾ cables eastward of Loculan point (*Lat. 8° 12′ N., Long. 123° 52′ E.*), and steer 183°, keeping a good look-out for the shoals on either side. This course should take her about 1¼ cables westward of Loculan shoals, the western limit of which is usually marked by a stake, but its presence must not be relied on. When the fort bears 254° she should steer about 230°, passing about 1¼ cables south-eastward of red buoy No. 4, and proceed as before directed.

Charts 3811, 3810.

Coast.—Light.—Between Binuni point and Camp Overton, about 11 miles eastward, several rivers discharge, and densely wooded hills rise close to the coast. Between Binuni point and a point one mile westward of the mouth of Ridapon river, 6½ miles eastward, the coast is fringed by a coral reef, extending nearly half a mile offshore in places, thence to the mouth of Agus river, 1¼ miles south-westward of

Charts 3811, 3810.

Camp Overton, there is very little reef, thence to Camp Overton it extends about a quarter of a mile offshore. Agus river, the outlet of Lake Lanao, about 13 miles southward of Camp Overton, is a rapid flowing river, descending about 2,200 feet (670^{m}6) in a distance of about 21 miles, and has a depth of 4 feet (1^{m}2) on its bar, with a somewhat greater depth for a short distance inside.

Camp Overton is an abandoned military post. A few broken piles mark the site of the former piers at this place and at Tominobo, about three-quarters of a mile eastward.

The town of Iligan stands on the northern side of the entrance to the river of the same name, which discharges about 2 miles north-eastward of Camp Overton. There is a depth of 3 feet (0^{m}9) on the bar of the river.

Close northward of the mouth of the river there is a concrete pier, 345 feet (105^{m}2) long, which had, in 1949, a depth of 32 feet (9^{m}8) at its head. Water is laid on to the pier. The pier, which was reported, in 1949, to be in a bad condition, is illuminated at night. The outgoing tidal stream off the pier is exceptionally strong when Iligan river is in flood.

A light is exhibited, at an elevation of 37 feet (11^{m}3), from a white steel tower at Iligan.

The submarine cable from Cagayan is landed on the northern side of the pier.

The anchorage off Iligan is bad as the depths are considerable close to the coastal reef, and during the North-east monsoon both this and the anchorage off Camp Overton are untenable ; at such time vessels seek shelter in Quinalang (Kinalang) cove.

From the town of Iligan to Initao point, 19½ miles north-north-eastward, and thence to Sulauan point, 10½ miles farther north-eastward, the coast is fringed by a narrow steep-to coral reef.

Quinalang cove, the southern entrance point of which is Quinalang (Kinalang) point, about 2¼ miles northward of Iligan, is a small indentation in the coast, where anchorage, sheltered from the North-east monsoon, may be obtained by vessels with local knowledge, in depths of from 20 to 25 fathoms (36^{m}6 to 45^{m}7), about 1¼ cables from the edge of the coastal reef. Mandulog river discharges on the eastern side of Quinalang point.

Naauan head, 12 miles northward of Quinalang point, can be identified by its low cliff. Maputi point, 1½ miles farther northward, and the southern entrance point of Initao bay, is rugged. Small vessels with local knowledge may obtain anchorage, in a depth of 3 fathoms (5^{m}5), off the village of Initao, situated at the head of the bay.

Macajalar bay.—Danger.—Macajalar (Makahalar) bay is entered between Sulauan point (*Lat. 8° 37′ N., Long. 124° 29′ E.*) and Gorda point, 16½ miles east-north-eastward. Sulauan point is low and wooded, and is bordered with low coral cliffs alternating with sandy beaches. It is fringed by a coral reef, which dries, extending nearly half a mile offshore. The western shore of the bay is low and fringed by steep-to coral reefs. The head of the bay is bordered by narrow coral reefs, and about one mile inland grass-covered hills rise to elevations of more than 1,500 feet (457^{m}2). The eastern shore is higher and consists of sand beaches separated by low, rocky points. A coral reef, which partly dries, extends about three-quarters of a mile north-

Charts 943, 1263.

Charts 3811, 3810.

ward of Malugan point, about 7½ miles south-eastward of Sulauan point, and between these points there are five small detached reefs, all of which lie within half a mile of the shore. The middle of the bay is deep and contains no detached dangers with the exception of Alutaya reef.

Cagayan (Kagayan) river, which discharges into the head of the bay, has a depth of 1½ fathoms ($2^{m}7$) over its bar, but the depth and direction of the channel across it are constantly changing with the freshets of the rainy season. A bank, with a depth of one fathom ($1^{m}8$) over it, extends about 3¾ cables from the river's mouth. Vessels with a draught of about 7 feet ($2^{m}1$) can enter the river at high water and reach the town of Cagayan (Kagayan), the capital of Misamis province, a distance of about 2 miles, above which it is not navigable, being encumbered with rocks. The anchorage in the vicinity of the Cagayan river is described below.

At the village of Bugo, about 5½ miles eastward of Macabalan (Makabalan) point, situated 5¾ miles east-south-eastward of Malugan point, there is a pier, the face of which is 200 feet ($61^{m}0$) in length, with a depth of 33 feet ($10^{m}1$) alongside ; water is laid on to the pier.

Tagoloan is a small town situated about 1½ miles from the mouth of the river of the same name, which discharges about 2¼ miles northward of Bugo. The bar at the mouth of the river is very shallow, and outside it the depths are too great to afford anchorage. Cabulig (Kabulig) bay, about 5½ miles northward of the entrance to Tagoloan river, affords anchorage, sheltered during the North-east monsoon, to vessels with local knowledge, but necessarily close in on account of the great depths. The village of Jasaan (Hasaan), with a prominent church, stands at the head of this bay.

Gorda point is wooded and steep-to ; it has a flat summit and is prominent from any part of Macajalar bay.

Alutaya reef, about 3½ miles south-westward of Gorda point, consists of a bank of sand and rocks awash. The channel between it and the eastern shore of the bay is 2¾ miles wide and deep.

Chart 957, plan of Kagayan anchorage.

Cagayan anchorage.—Light.—Buoy.—Macabalan point, about three-quarters of a mile south-eastward of the eastern entrance point of Cagayan river, is low, sandy, and on it are a few native houses and coconut trees. It is steep-to on its eastern side, but the coastal bank extends about 4 cables offshore between the point and the mouth of Cagayan river. The cable from Iligan is landed on Macabalan point.

A light is exhibited, at an elevation of 58 feet ($17^{m}7$), from a white steel tower, on Macabalan point (*Lat. 8° 30′ N., Long. 124° 40′ E.*).

A red conical buoy is moored about 4 cables northward of the lighthouse, and marks the edge of the coastal bank extending about half a mile northward from Macabalan point. This buoy was reported missing in 1950.

About 2½ cables southward of the lighthouse there is a pier, 498 feet ($151^{m}8$) long, which had, in 1950, a depth of 22 feet ($6^{m}7$) alongside.

There are a few warehouses, and some native houses near the pier. This is the landing place for the town of Cagayan.

Vessels not intending to go to the pier may obtain anchorage, in depths of from 18 to 30 fathoms ($32^{m}9$ to $54^{m}9$), with the pier bearing 328°, distant about one cable.

Charts 943, 1263.

Chart 957, plan of Kagayan anchorage.

There are several hospitals in Cagayan.

There is regular communication by steamer with Cebu.

Charts 3811, 3810.

Coast.—Dangers.—Balingasag bay is entered between Gorda point and Banbayan point, 4 miles north-north-eastward. The town of Balingasag, the largest and most prominent in the vicinity, stands at the head of the bay. The usual anchorage for vessels with local knowledge is off the town, in a depth of 9 fathoms ($16^{m}5$), sand, 2 cables offshore. A better protected anchorage may be obtained during the South-west monsoon near the head of the bay, in a depth of 12 fathoms ($21^{m}9$), mud, with the church bearing 005° and the northern tangent of Gorda point, 265°.

Constancia reef, with a least depth of 1½ feet ($0^{m}5$) over it, lies about 3¾ cables westward of Banbayan point.

Between Banbayan point and Bagacay (Bagakay) point, about 12 miles northward, the coast is fringed by a narrow steep-to coral reef, and there are no detached dangers except for a small coral reef, with a depth of 2½ fathoms ($4^{m}6$) over it, lying a quarter of a mile offshore and 5¾ miles northward of Banbayan point. There is a narrow deep channel between this reef and the coast.

Chart 3810.

From Bagacay point to Sipaca (Sipaka) point, 6¼ miles east-north-eastward, the coast is fringed by a steep-to coral reef, which attains its greatest width off the town of Bagacay (Bagakay), about one mile north-eastward of Bagacay point, where it extends over half a mile offshore, and mostly dries.

Canauayor (Kanauayor) islet, 1¾ miles westward of Sipaca point and about a quarter of a mile offshore, is 110 feet ($33^{m}5$) high, and is connected to the mainland south-eastward by a coral reef which nearly dries. About 1½ cables westward of the islet is the entrance to a break in the coastal reef leading to Canauayor anchorage where small craft with local knowledge may obtain anchorage, in depths of from 8 to 9 fathoms ($14^{m}6$ to $16^{m}5$), about 1½ cables northward of a warehouse with a galvanised iron roof standing in the western part of the village of Balinguan. There is a small pier, with a depth of 8 feet ($2^{m}4$) at its head.

Charts 3811, 3810.

Camiguin island.—Camiguin (Kamigin) island lies 5¼ miles north-westward of the coast of Mindanao between Bagacay and Sipaca points. It is extremely mountainous and steep, the highest peak of Mount Mambajao (Mambahao), in the middle of the island, having an elevation of 5,620 feet ($1,713^{m}0$); the whole island except high up on the mountain slopes, is cultivated; above 1,500 feet ($457^{m}2$) the mountains are heavily wooded. The coasts, except near Catarman (Katarman) point (*Lat. 9° 13′ N., Long. 124° 38′ E.*), the north-western extremity, and a few detached bluffs, are low, sandy, and fringed with narrow steep-to coral reefs. Mambajao (Mambahao), Mahinog, Sagay, Bonbon, and Agoho are the principal towns; indifferent anchorage, according to the season, may be obtained by vessels with local knowledge off these places, but necessarily very close in on account of the great depths. The principal exports are hemp and copra. The channel between Camiguin island and Mindanao is clear of dangers.

Medano islet is a sand cay, about 6 feet ($1^{m}8$) high, with a few bushes

Charts 943, 1263.

Charts 3811, 3810.

on it, lying about one mile north-westward of Agoho, on the north-western side of Camiguin island. It is fringed by a coral reef, which, on its eastern side, extends about half a mile offshore. The channel between it and Camiguin island is deep and clear of dangers.

In January, 1875, H.M.S. *Challenger* anchored north-westward of the town of Agoho, in a depth of 6 fathoms ($11^{m}0$), with the north-west point of Camiguin island bearing 232° and Medano islet, 322°.

Port Mambajao, close eastward of the northern extremity of the island, is described below.

There is a large white stone church at Mahinog, on the eastern side of the island, about 7 miles south-south-eastward of Mambajao, which is visible for a distance of about 5 miles. Anchorage may be obtained by vessels with local knowledge off Mahinog, in a depth of 15 fathoms ($27^{m}4$), sand. A break in the fringing reef about 1½ miles southward of Mahinog affords a well protected landing place. There is a small pier here, with a depth of 6 feet ($1^{m}8$) at its head.

Sagay is a small town situated 3¼ miles north-westward of Farol point, the southern extremity of the island. Anchorage, protected only during the North-east monsoon, may be obtained by vessels with local knowledge, in a depth of 12 fathoms ($21^{m}9$), sand, with the north gable of the church bearing 002°. This white church is visible at a distance of about 20 miles.

Port Mambajao. — Light. — Mambajao (Mambahao) is the principal town of Camiguin island. A reef fringes the coast in front of the town and extends about one cable offshore on either side of the stone jetty, which is about a cable long, with a depth of 14 feet ($4^{m}3$) at its head. Small craft can approach the head of the jetty through a break in the reef, and secure alongside the western face of the jetty.

A light is exhibited, at an elevation of 32 feet ($9^{m}8$), from a white concrete pillar, on the head of the stone jetty.

Vessels with local knowledge may obtain anchorage, in a depth of 18 fathoms ($32^{m}9$), sand, with the head of the jetty bearing 204°, distant about a quarter of a mile. Small vessels may anchor closer in on the same bearing of the jetty, in a depth of 11 fathoms ($20^{m}1$), with Medano islet just open of a single tree on the extremity of the point westward of Mambajao.

Radio station.—There is a radio station at Mambajao. *See* page 14.

Off-lying islet and dangers.—Jigdup (Higdup) reef, with a depth of about 4 feet ($1^{m}2$) over it, lies 4 miles eastward of Mambajao light-structure.

Mantigui (Bantigui) islet (*Lat.* 9° *10′ N., Long. 124° 49′ E.*), lying 1¾ miles from the eastern side of Camiguin island and about 4 miles north-north-eastward of Cabuang (Kabuang) point, the south-eastern extremity of the island, is low, wooded, and sandy. Coral reefs extend about 6½ cables from its northern and eastern sides, while the southern side is steep-to.

Bulias shoal, with a depth of 4¼ fathoms ($7^{m}8$) over it, lies about 1½ miles northward of Mantigui islet.

Chart 3810.

Coast.—Sipaca point is a bold conical hill rising from the water's edge to an elevation of 875 feet ($266^{m}7$), and from a distance it appears

Chart 3810.

as an island. It is connected to the mainland by a mangrove swamp, through which there is reported to be a shallow channel.

Gingoog bay. — Anchorages. — Dangers. — Gingoog bay is entered between Sipaca point and Diuata point, about 20 miles east-north-eastward. The shores of the bay are fringed with narrow, steep-to coral reefs ; in the bay there are considerable depths and no dangers outside a distance of one mile offshore. Between Sipaca point and Gingoog village, 17½ miles south-eastward, and a short distance inland, densely wooded mountains rise to an elevation of about 3,800 feet (1,158^{m}2). There are several villages and coconut groves on this stretch of coast.

Talisayan, the principal town in Gingoog bay, is situated about 1¼ miles south-eastward of the summit of Sipaca point. A detached coral shoal, with a least depth of 4 fathoms (7^{m}3) over it, lies a quarter of a mile offshore, with a prominent building with a galvanised iron roof near the beach at Talisayan bearing 237°. There is a deep channel, clear of dangers, between it and the coastal reef. Anchorage may be obtained by vessels with local knowledge, but exposed to north-easterly winds, close to the coastal reef northward of the town, in a depth of 20 fathoms (36^{m}6).

Good anchorage may be obtained by vessels with local knowledge, in a depth of 15 fathoms (27^{m}4), sand, off Gingoog village, about a quarter of a mile offshore. A small coral shoal, with a depth of 1½ fathoms (2^{m}7) over it, lies about one mile west-north-westward of Gingoog and three-quarters of a mile offshore, with a deep channel half a mile wide between the shoal and the coastal reef.

There is a **T**-shaped pier, 100 feet (30^{m}5) long, with a depth of 65 feet (19^{m}8) alongside, situated about 3 miles north-westward of Gingoog village.

Odiongan village, situated at the mouth of the river of the same name, lies 4 miles east-north-eastward of Gingoog. A ridge of coral and sand, with irregular depths of from 3 to 7 fathoms (5^{m}5 to 12^{m}8) over it, northward of the eastern side of the entrance to the river, affords excellent anchorage for small vessels with local knowledge. About one mile westward of Odiongan is a pier, 350 feet (106^{m}7) long, with a depth of 30 feet (9^{m}1) alongside. Water is laid on to the pier.

Anchorage may be obtained, in a depth of about 20 fathoms (36^{m}6), sand, about 4 cables offshore, off Odiongan.

About 5 miles southward of Diuata point is Linugos village, off which there is a break in the coastal reef about a quarter of a mile wide, which affords good anchorage for vessels with local knowledge, in depths of 7 fathoms (12^{m}8), sand and mud well protected from north-easterly winds. Diuata point, low and densely wooded, rises to an elevation of 1,165 feet (355^{m}1) about 3¼ miles southward. The coast consists of coral with coral-sand beaches, and is fringed by a narrow, steep-to reef, which widens to a distance of three-quarters of a cable westward of the point.

Butuan bay.—Butuan bay, entered between Diuata point (*Lat. 9° 06′ N., Long. 125° 13′ E.*) and Tubay point, about 19 miles east-north-eastward, is clear of dangers and has considerable depths.

The southern shore of the bay, between the village of Nasipit, 10 miles south-eastward of Diuata point, and Agusan river, which discharges about 11 miles eastward, is low and heavily wooded to the

Charts 943, 1263.

Chart 3810.

sandy beach. There are some scattered houses and clearings on this stretch of coast, which is intersected by several rivulets. The coastal bank does not extend more than half a mile from the shore anywhere between these two points.

The eastern shore of the bay, from Mount Tubay, 1,468 feet (447^{m}4) high and prominent, lying close to the shore, about 1¾ miles north-eastward of Tubay point, to the entrance to Agusan river, is low, densely wooded, and fringed by a sand beach, off which the coastal bank, which is very steep-to at its edge, extends from half to three-quarters of a mile.

From Diuata point to the entrance to Nasipit harbour the shore is fringed by a reef which extends from a quarter to half a mile offshore.

Chart 957, plan of Nasipit harbour.

Nasipit harbour.—Nasipit harbour is formed by an opening between bluff rocky headlands about 4 cables apart, and extends about one mile southward. Both entrance points are fringed with reefs, which show plainly on a clear day; that on the western side partially dries and extends 3 cables northward from the point. The reef on the eastern side, which partially dries, extends westward 1¾ cables, and continues much farther in than that on the western side, which is narrower. The bluffs forming the entrance and the coconut groves are good landmarks for making the harbour. The village of Nasipit stands on the bluff forming the eastern entrance point.

There is a pier, 100 feet (30^{m}5) long, with a depth of 21 feet (6^{m}4) at its head, on the eastern side of Nasipit harbour, but, in 1949, there was a wreck at its head, rendering the pier useless.

A rock, awash, lies on the western side of the entrance, about 1¼ cables east-north-eastward of the western entrance point; there is shoal water between it and the point.

The outer part of the harbour affords excellent anchorage for moderate-sized vessels, in depths of from 6 to 9 fathoms (11^{m}0 to 16^{m}5). The inner part of the harbour is practicable only for small craft.

Chart 957, plan of Agusan river entrance.

Agusan river. — Light. — Buoys. — Beacon. — Agusan river, the second largest river in Mindanao, is divided at its mouth into two channels by Pontod island, a sandy cay with a settlement and the pilot station on its southern end. The bar of the northern entrance has a depth of only 3 feet (0^{m}9) over it, and is not used. The southern entrance has a width of about three-quarters of a cable at its narrowest part, and a depth of 9 or 10 feet (2^{m}7 or 3^{m}0) may usually be carried over the bar at low water and from 12 to 14 feet (3^{m}7 to 4^{m}3) at ordinary high water. A shoal of hard gravel, with depths of from one to 5 feet (0^{m}3 to 1^{m}5) over it, extends a quarter of a mile southward from Pontod island.

A light is exhibited, at an elevation of 39 feet (11^{m}9), from a concrete beacon, on the eastern side of the entrance to Agusan river.

A white triangular beacon is situated at Magallanes (Baug) village (*Lat. 9° 01′ N., Long. 125° 31′ E.*), about 2 cables north-westward of the light-structure.

Two conical buoys, painted in vertical stripes, are moored about 2 and 7 cables, respectively, westward of the beacon at Magallanes.

The rainy season begins in December and lasts about 4 months.

Charts 943, 1263.

Chart 957, plan of Agusan river entrance.

The river during these months is very high and filled with floating débris, most of which can be avoided by anchoring under the lee of a point. There is a constant current setting out of the river at all times of the year, and at times runs at a considerable rate. Baug river discharges into Agusan river on the south-eastern side of Magallanes.

Pilots.—There are no regular pilots in attendance. Vessels without local knowledge are advised to arrange for a pilot in advance.

Anchorages.—**Directions.**—There is no good anchorage outside the entrance to Agusan river, the depths being too great and the bar steep-to. Good anchorage for small vessels that do not intend to ascend the river may be obtained at the mouth of Baug river. Vessels proceeding to Butuan should anchor below the upper wharf as the river above it is contracted by a shoal extending from the western bank. To cross the bar in the greatest depth a vessel should steer for the beacon at Magallanes, bearing about 098°.

In 1949, it was reported that the channel over the bar had shifted northward. Caution should be observed when entering.

Butuan.—Butuan, the capital of the Agusan province, stands on the west bank of Agusan river, about 5 miles from the entrance. From inside the bar to the town a depth of about 15 feet ($4^{m}6$) can be carried at low water. There are two wharves at Butuan, that nearest the mouth having a depth of 14 feet ($4^{m}3$) alongside.

There is a considerable trade in hemp and copra, principally with Cebu.

Chart 3810.

Coast. — **Light.** — Cabadbaran (Kabadbaran) and Tubay, lying 5¾ and 8¼ miles, respectively, northward of the northern entrance point of Agusan river, are the only towns on the eastern shore of Butuan bay. They are of little commercial importance and are only occasionally visited by coasting steamers.

A light is exhibited, at an elevation of 33 feet ($10^{m}1$), from a white circular steel tower, on the southern side of the entrance to Cabadbaran (Kabadbaran) river (*Lat. 9° 08′ N., Long. 125° 32′ E.*).

Tubay river, which discharges on the northern side of the town of Tubay, is a swift running stream with a shallow bar. Cabadbaran river, the bar of which dries, flows out on the northern side of the town of Cabadbaran. Anchorage may be obtained by vessels with local knowledge southward of a sand spit which extends westward from the southern bank of Cabadbaran river, and about one mile north-north-westward of the town of Tubay and 4 cables offshore, in depths of from 12 to 15 fathoms ($21^{m}9$ to $27^{m}4$).

Charts 3810, 3826.

Between Tubay and Madilao point, about 37 miles north-north-westward, the coast rises to two mountain ranges, and is bold and steep-to, and there are no off-lying dangers. Madilao point is 270 feet ($82^{m}3$) high and steep-to, and is composed of dark rock. Between Madilao point and Bilaa point, 3¾ miles north-eastward, there is a bay in which vessels with local knowledge may obtain anchorage, sheltered from north-east, through east, to south-west, but necessarily close in because of the great depths.

For the western entrance to Hinatuan passage, and general remarks on Surigao strait, *see* pages 612 and 584.

Charts 943, 1263.

CHAPTER XI

NORTH AND EAST COASTS OF LUZON TO THE ENTRANCE TO SAN BERNARDINO STRAIT

Charts 3804, 3805.

NORTHERN SIDE OF LUZON.—Coast.—Cape Bojeador, the north-western extremity of Luzon, is low near its outer end, but rises gradually to broken ridges, bare of trees, about 2 miles eastward. The northern limit of the cape is a point about 2 miles north-north-eastward of its extremity, consisting of black coral cliffs underworn by the sea, about 50 feet ($15^{m}2$) high, and covered with grass. There is an indentation in the coral reef close southward of this point where landing can be effected, except during north-westerly winds. Between this indentation and the western extremity of the cape, a coral reef extends about 3¾ cables offshore and there are depths of less than 5 fathoms ($9^{m}1$) three-quarters of a mile offshore. Detached coral heads and sunken boulders lie half a mile offshore and outside the line of breakers.

Light.—A light is exhibited, at an elevation of 386 feet ($117^{m}6$), from a white octagonal tower, with a dwelling attached, on the summit of a prominent hill, situated about one mile eastward of the northern extremity of Cape Bojeador (*Lat. 18° 31′ N., Long. 120° 36′ E.*).

Climate and weather.—*See* page 16.

Coast.—Dangers.—Bangui bay is entered between Negra point, a black rocky point fringed by a narrow reef, 3 miles north-north-eastward of Cape Bojeador lighthouse, and Dialao point, 9½ miles north-eastward. A coral ledge extends about 1¾ cables northward from Negra point, and there is a black rock, 6 feet ($1^{m}8$) high, about half a cable north-eastward of the point. For 2½ miles eastward of Negra point the coast consists of rapidly eroding cliffs, off which there are some boulders, and a group of white rocks lies close off Blanca point, about 1½ miles eastward of Negra point. From the eastern termination of the cliffs as far as Burayoc (Burayok) point, about 2¾ miles southward of Dialao point, the coast is low and fringed by a sandy beach.

A detached rocky shoal, with a least depth of 1¼ fathoms ($2^{m}3$) over it, lies 6½ cables south-south-westward of Burayoc point, and a shoal, with a depth of 4 fathoms ($7^{m}3$) over it, lies about half a mile southward of Sugiab point, situated about one mile northward of Burayoc point.

Dialao point is low, wooded, and fringed by a narrow coral reef and a white sandy beach; it is backed by a well defined, reddish-coloured ridge, about 600 feet ($182^{m}9$) high, running parallel with the

Charts 2661b, 1263.

Charts 3804, 3805.

coast and almost bare of trees. This is the only reddish-coloured ridge in the vicinity. Anchorage may be obtained by vessels with local knowledge, sheltered from southerly winds, in Bangui bay.

The town of Bangui, situated at the head of Bangui bay, about 2¾ miles southward of Burayoc point, is not visible from seaward, being hidden by trees.

The tidal streams which set eastward and westward off Dialao point are strong, and there are eddies and whirlpools.

Mayraira point, the northern extremity of Luzon, is fringed by a reef which extends from about one to 1½ cables offshore, and depths of less than 5 fathoms ($9^{m}1$) extend about 3 cables northward. A ridge, with a depth of 10 feet ($3^{m}0$) at its outer end, extends about three-quarters of a mile north-eastward from the point. Tide-rips occur off this shoal.

In Pasaleng bay, entered between Nuang point, about 2¼ miles south-eastward of Mayraira point, and Puac point, 7 miles east-south-eastward, the depths are great, and there is no sheltered anchorage; the shores are mostly steep, except at the head, and there are no dangers outside a distance of half a mile offshore. Patapat mountains rise steeply from the south-western shore to an elevation of over 4,000 feet ($1{,}219^{m}2$) and Caraballo (Karaballo) mountains, which are densely wooded, rise steeply from the eastern shore. About 1¼ miles south-eastward of Mayraira point and about a quarter of a mile offshore are Dos Hermanos, two rocks above water. A 2½-fathom ($4^{m}6$) patch lies about 3½ cables north-westward of Dos Hermanos and 1¾ cables offshore. Madamba rock, 25 feet ($7^{m}6$) high, lies about half a mile westward of Puac point. The village of Pasaleng stands at the head of the bay.

Small vessels with local knowledge may obtain anchorage with south-westerly winds, in a depth of 9 fathoms ($16^{m}5$), in Baugan bay, close westward of Nuang point.

Claveria bay is entered between Baket-baket (Babatkain) point (*Lat. 18° 37′ N., Long. 121° 02′ E.*), situated about 3 miles east-north-eastward of Puac point, and Centinela point, 3½ miles farther eastward. A 15-foot ($4^{m}6$) patch lies about half a mile northward of Baket-baket point, and tide-rips occur in its vicinity. About three-quarters of a mile eastward of Baket-baket point is Lacay Lacay point, the termination of a small peninsula extending about half a mile northward. Cabicungan (Kabikungan) river discharges into the eastern part of the bay, and on the western side of its mouth is the town of Claveria. Centinela point, off which tide-rips occur, is 165 feet ($50^{m}3$) high. Anchorage in the bay may be obtained by vessels with local knowledge, in depths of from 10 to 15 fathoms ($18^{m}3$ to $27^{m}4$), sand, sheltered except during northerly winds, about 4 cables northward of Claveria. There is a small pier at Claveria, with a depth of about 5 feet ($1^{m}5$) alongside.

Entrance to Cabicungan river is difficult as the sea breaks on the bar in all but the calmest of weather.

Pata point, 3¼ miles eastward of Centinela point, rises to a knoll, 275 feet ($83^{m}8$) high, about 3 cables south-westward. Pata river discharges at the point. In 1938, it was reported that there was a depth of 5 feet ($1^{m}5$) on the bar.

Light.—A light is exhibited, at an elevation of 202 feet ($61^{m}6$), from a white concrete dwelling, on Pata point.

Charts 2661b, 1263.

Charts 3804, 3805.

Tidal streams.—The tidal streams off the north coast of Luzon during the South-west monsoon follow the general trend of the coast, and there is an eddy stream close offshore.

Coast.—A sandbank, on which the sea breaks heavily in bad weather, extends about a quarter of a mile from the mouths of Pamplona and Abulug rivers, which discharge about 13½ and 17 miles, respectively, south-eastward of Pata point. The coast between Pata point and the mouth of Abulug river is otherwise free from danger. The village of Pamplona is situated about 2½ miles from the mouth of the river of the same name. In 1935, a new outlet to Abulug river, with a depth of 10 feet (3^{m}0) in its entrance, was formed close westward of Abulug village, and the old mouth was nearly closed. Between the old entrance to Abulug river and the mouth of Cagayan (Kagayan) river, 13 miles south-eastward, the coast is low and sandy.

Cagayan river. — Light. — Buoy. — Cagayan (Kagayan) river is the largest in Luzon, and the town of Aparri, which is open to foreign shipping, on the eastern entrance point, is the principal port in northern Luzon. The channel over the bar, in 1938, had a least depth of 14 feet (4^{m}3), but the depth is continually changing. At times the bar is impassable during the North-east monsoon, when vessels are obliged to seek shelter in Port San Vicente (page 502). Heavy tide-rips occur off the entrance to the river.

Pilotage for the port of Aparri is compulsory. Pilots are always in attendance when it is possible for vessels to enter. *See* Harbour regulations on page 4.

A red conical buoy is moored on the western side of the approach to the entrance to the river, about 1¾ miles north-north-eastward of Linao lighthouse.

A light, named Linao, is exhibited, at an elevation of 36 feet (11^{m}0), from a white cylindrical tower, with a white dwelling attached, about three-quarters of a mile west-north-westward of the western entrance point of Cagayan river.

The village of Linao (*Lat. 18° 23′ N., Long. 121° 35′ E.*) is situated on the western entrance point of Cagayan river, and Linao river discharges close southward of it. There is a jetty on the eastern side of the entrance to Cagayan river. Camalaniugan (Kamalaniugan), about 6 miles from the entrance, is the head of navigation for sea-going vessels, and vessels with a draught of about 6 feet (1^{m}8) can reach Lallo, about 10½ miles from the entrance.

At times freshets occur, causing the river to rise rapidly, when precautions should be taken against the strong current and débris brought down with it.

Anchorages.—The best anchorage outside the bar is in a depth of 10 or 12 fathoms (18^{m}3 or 21^{m}9), sand and mud, with Aparri church bearing 180°, and the lighthouse, 247°. The usual anchorage for vessels after entering the river is in the channel opposite the town of Aparri.

Radio station.—There is a radio station at Aparri, *see* page 14.

Storm signals.—Storm signals are shown at Aparri, *see* page 11.

Climatic table.—*See* page 35.

Coast.—Between Aparri and Batulinao point, about 27 miles eastward, the coast is low and bordered by a sandy beach; there are no off-lying dangers. At the village of Buguey, about 12 miles east-

Charts 2661b, 1263.

Charts 3804, 3805.

south-eastward of Aparri, there is a stone church and a building with a white roof, both of which are prominent. About 4 miles farther in the same direction Buguey river discharges, but breakers usually make the bar impassable; the entrance may be identified by the village of Minanga on the western side.

Palaui island, 976 feet (297^m5) high, lies close off Nulton point, the north-western and low point of the large promontory, which forms the north-eastern extremity of Luzon. The western side of the island is bold, except for a rock, awash, which lies one mile northward of Puerto point, a high, wooded bluff forming the southern extremity of the island. A reef, which dries, extends about 1½ miles from the eastern side of the island, with Escucha islet, 60 feet (18^m3) high and wooded, and Cent islet, 3¼ cables southward of it, lying near the outer edge.

Cape Engaño (*Lat. 18° 35′ N., Long. 122° 08′ E.*) is the northern extremity of Palaui island, and lying within half a mile north-north-eastward of it are Dos Hermanos islets. Gran Laja rock is a low rock lying one mile north-eastward of the north-eastern extremity of Palaui island.

A light is exhibited, at an elevation of 327 feet (99^m7), from a grey granite tower, with a white lantern and dwelling attached, on the summit of the hill above Cape Engaño.

Anchorage. — Directions. — Beacon. — Small vessels with local knowledge may obtain good anchorage in Engaño cove, southward of Cape Engaño, in a depth of about 19 fathoms (34^m7), protected except from north-westerly and westerly winds. A reef extends about three-quarters of a cable from the southern side of the cove.

A vessel should enter with a framework beacon, situated at the head of the cove, bearing 114°, and anchor about half a mile from the beacon.

Chart 3545, plan of Port San Vicente.

Port San Vicente. — Dangers. — Buoy. — Light. — Port San Vicente consists of an outer and inner harbour. The outer harbour lies southward of the island of the same name, and between Puerto point (*Lat. 18° 30′ N., Long. 122° 07′ E.*) on the west and the coast of Luzon southward of Nulton point on the east. The inner harbour, a small cove between the north-eastern side of San Vicente island and the southern side of Palaui island, is practically landlocked. The shores of the inner harbour are fringed with reefs which extend from half a cable to about 3¼ cables, and near the middle, about 4 cables north-eastward of the northern extremity of San Vicente island, is a shoal, with a depth of 13 feet (4^m0) over it. The inner harbour is an excellent refuge for small vessels during typhoon weather.

Port San Vicente should only be entered from south-westward; the north-eastern approach is encumbered with reefs and shoals. Rona islet, 25 feet (7^m6) high and wooded, lies near the south-western end of a reef which dries in the middle of the fairway, about one mile north-eastward of Morgan point, the north-eastern entrance point of the inner harbour.

San Vicente island lies with New Orleans point, a prominent green bluff, and its southern extremity, about one mile eastward of Puerto point. The island is fringed by a reef, which dries, extending about one cable southward, and 3¼ cables eastward; the passage between its western side and Palaui island is filled with a reef which dries, and extends southward to a position about 3 cables south-westward of New Orleans point.

Chart 1263.

Chart 3545, plan of Port San Vicente.

A detached reef, with a depth of 3 feet ($0^{m}9$) over it, lies a quarter of a mile westward of Nulton point, and is marked on its north-western side by a red conical buoy. The fairway to the inner harbour lies between this buoy and the reef extending from the eastern side of San Vicente island, and has a least width of 1¼ cables abreast the buoy.

A light is exhibited, at an elevation of 31 feet ($9^{m}4$), from a white concrete tower, on a white concrete pedestal with a black band, on the eastern extremity of the reef extending from the eastern side of San Vicente island.

Anchorages.—Directions.—Anchorage may be obtained in the outer harbour, with Escucha (chart 3804) and Rona islets in line, bearing 037°, and Puerto point, 277°, in a depth of about 7 fathoms ($12^{m}8$), mud, but it is exposed to westerly and south-westerly winds.

Small vessels may obtain anchorage in the middle of the inner harbour, in depths of from 4 to 4½ fathoms ($7^{m}3$ to $8^{m}2$), mud.

To approach the outer harbour from westward a vessel should pass three-quarters of a mile southward of Puerto point, and thence steer eastward until Rona and Escucha islets are in line, when she should keep on this alignment, which will lead to the anchorage.

To enter the inner harbour from the anchorage recommended in the outer harbour, the vessel should steer for the light-tower, and round its southern and eastern sides at a distance of from three-quarters of a cable to one cable, anchoring about a quarter of a mile north-north-westward of it. The red buoy marking the reef with a depth of 3 feet ($0^{m}9$) over it westward of Nulton point may be passed close-to on its north-western side.

Tidal streams.—Between the light-tower and Nulton point the tidal streams set north-eastward and south-westward at a rate of from 3 to 4 knots.

Charts 3804, 3805.

Coast.—From the north-eastern entrance of Port San Vicente to Escarpada point (*Lat. 18° 32′ N., Long. 122° 13′ E.*), the north-eastern extremity of Luzon, the coast is high and bordered by reefs with detached rocks. Escarpada point is a grey rocky promontory with a serrated summit; at the southern end of the promontory there is a prominent sandy beach.

A bank, with depths of from 5 to 10 fathoms ($9^{m}1$ to $18^{m}3$), sand and rock, extends about 2½ miles northward from Escarpada point.

Tidal streams.—In Babuyan channel, between Cape Engaño and Camiguin (Kamigin) island, the south-easternmost of the Babuyan islands, 21 miles north-westward, the stream sets strongly northward during the South-west monsoon.

The tidal streams along the southern side of Babuyan channel are at times very erratic, and there are numerous tide-rips and eddies. Close offshore, however, the streams are weaker and set parallel with the coast. The slack period during the change of the streams is usually very short. The out-going stream from Cagayan river are felt well offshore after heavy rains, and a northerly set has been reported as much as 20 miles northward of the mouth of the river.

Babuyan islands.—Babuyan islands are described in China Sea Pilot, Vol. III.

Chart 1263.

Outlying shoals.—Anson or Clare shoal, lying about 165 miles

Chart 1263.

east-south-eastward of Cape Engaño, was reported, in 1848, by the master of the ship *Earl of Clare.* The bottom was reported to have been seen distinctly about 20 yards ($18^{m}3$) from the ship.

A chart of 1843 showed a shoal, named Lord Anson's shoal, in the approximate position given by the master of the *Earl of Clare,* and the Galleon chart in " Lord Anson's voyage " shows a shoal in the same latitude, but 5° farther eastward.

Anson shoal has been searched for unsuccessfully.

A bank, with a depth of 38 fathoms ($69^{m}5$) over it, was reported, in 1945, to lie about 115 miles south-south-westward of Anson shoal.

Charts 3804, 3805.

EASTERN SIDE OF LUZON.—Coast.—The east coast of Luzon is rugged and densely wooded throughout; inland it rises to the Sierra Madre, which lies parallel with the coast at distances between 5 and 7 miles and appears as an impenetrable barrier separating the coast from the Cagayan valley.

Between Escarpada point (*Lat. 18° 32′ N., Long. 122° 13′ E.*) and Iligan point, about 14 miles south-south-eastward, there are numerous small coves, well sheltered but suitable only for native craft.

The tidal streams are irregular, but generally set parallel with the coast, at an estimated maximum rate of about 2 knots. There are tide-rips in the vicinity of Escarpada point, Iligan point, and Maloncon island, about 4 miles farther southward.

Patunungan bay, entered about 5½ miles north-north-westward of Iligan point, is formed by an opening in the extensive reef which extends offshore in this vicinity. The entrance, although narrow, has a least depth of 6 fathoms ($11^{m}0$), and may be identified by Masak rock, 43 feet ($13^{m}1$) high, on its north-western side, and Susak rock, 21 feet ($6^{m}4$) high, on its south-eastern side.

Tinago cove, about 2 miles south-south-eastward of Patunungan bay, is completely landlocked, and has a depth of one fathom ($1^{m}8$), mud. Mount Tinago, 823 feet ($250^{m}8$) high, with a serrated summit, lies about half a mile south-westward of Tinago cove. A coral reef, which dries, extends a quarter of a mile offshore between Tinago cove and Pananapan point, about one mile southward. Iligan point is 240 feet ($73^{m}2$) high, and covered with grass, and rises to an elevation of 530 feet ($161^{m}5$) about 4 cables within. A prominent rock, 11 feet ($3^{m}4$) high, lies close off the point. Mount Marotang, 1,290 feet ($393^{m}2$) high, and densely wooded, lies about one mile south-westward of Iligan point; from north-eastward it appears as a sharp peak with steep slopes, but from south-eastward as a bee-hive shape; it is one of the most prominent peaks in this vicinity.

Chart 3805.

From Iligan point to Palanan point, 71 miles southward, there is a succession of small bays open to the sea, with short stretches of sandy beach, backed by steep mountains.

Maloncon island, 354 feet ($107^{m}9$) high, lies about half a mile offshore; it has a sharp summit and appears with steep sloping sides when seen from south-westward or north-eastward.

Mount Nimamandum, 1,335 feet ($406^{m}9$) high, lies about 7 miles south-south-westward of Iligan point and about half a mile within Nanisetan point. Mount Canapauan, 2,018 feet ($615^{m}1$) high, lies

Chart 3805.

about 3 miles south-westward of Mount Nimamandum, and may be identified by its flat summit when seen from south-eastward; it is the highest mountain in this vicinity. About 2½ miles south-westward of Nanisetan point is Naglocsaden point, from which foul ground, with rocks awash, and a 19-foot ($5^{m}8$) patch at its outer end, extends about half a mile southward; there are tide-rips off this foul ground.

Good anchorage may be obtained by vessels with local knowledge in J. B. Miller bay, between Bolos point, 5 miles south-westward of Naglocsaden point, and Cabutunan point, about 3¼ miles farther southward. Bolos point is bold, rocky and densely wooded. Cabutunan point is low, covered with grass, and fringed by a coral reef. About 3½ miles southward of Cabutunan point is Capulutan point, a bold rocky headland, 190 feet ($57^{m}9$) high, with Mount Capulutan, 1,078 feet ($328^{m}6$) high, about three-quarters of a mile south-westward. About midway between Cabutunan and Capulutan points is a deep rocky gorge, which is an excellent landmark visible from all directions seaward.

Ninauan point (*Lat. 17° 59′ N., Long. 122° 11′ E.*) lies about 1½ miles southward of Capulutan point, and about the same distance farther southward Taboan river discharges. Valley head, 3¾ miles southward of Ninauan point, is a triple pointed headland with rocky cliffs. Between Valley head and Baguio point, about 13 miles southward, there are several bights which afford shelter to vessels with local knowledge, in depths of from 3 to 7 fathoms ($5^{m}5$ to $12^{m}8$), sand or coral, with offshore winds. Thence southward the coast is fringed by reefs to and including Divilacan bay. The tidal streams off this coast attain a rate of from 2 to 2½ knots.

Twin peaks, 3,143 and 3,217 feet ($958^{m}0$ and $980^{m}6$) high, and sharp pointed, lie about 3 miles westward of Valley cove, which is situated about 5 miles southward of Valley head, and are easily identified. Baguio point is 164 feet ($50^{m}0$) high, and shows as a sharp knoll; there is a black detached rock close off the point, which assists to identify it. Flat peak, 4,765 feet ($1{,}452^{m}4$) high, lies at the southern end of the flat ridge which extends about 7½ miles southward from the Twin peaks; it may easily be identified by its sheer rocky eastern face. Mount Cetaceo, 6,014 feet ($1{,}833^{m}1$) high, with a dome-shaped summit, lies about 6½ miles westward of Baguio point; it is the highest peak in the vicinity and is an excellent landmark. Ilang river discharges about 2¼ miles southward of Baguio point. Fresh water can be obtained here. Thumb peak, 12¼ miles southward of Baguio point and 3 miles from the coast, is 3,771 feet ($1{,}149^{m}4$) high, and is prominent from east and south-east.

Divilacan bay is open northward, and is encumbered with shoals and reefs; its shores are low and densely wooded. A reef extends about 8 cables northward from Gay island, which lies close northward of the eastern entrance point of the bay, and a detached shoal, with a least depth of 37 feet ($11^{m}3$) over it, lies 1¾ miles north-eastward of the island. Several large streams discharge into the bay. Mount Divilacan, 4,350 feet ($1{,}325^{m}8$) high, the highest and easternmost peak in the vicinity, lies about 10½ miles south-south-westward of the eastern entrance point of the bay, and is prominent.

Anchorage may be obtained by vessels with local knowledge during south-westerly winds in the middle of the south-eastern bight of

Chart 1263.

Divilacan bay, in depths of from 7 to 9 fathoms ($12^{m}8$ to $16^{m}5$). A well-protected anchorage for vessels with local knowledge may be obtained in the north-western bight, in a depth of 5 fathoms ($9^{m}1$), hard sand. This anchorage is protected from all except easterly winds, but the reefs at the entrance give some protection from the easterly swell. Anchorage, fairly well protected from the east, may be obtained westward of Gay island.

Port Dimalansan is entered between Gay island and Estagno island, about one mile south-eastward; it has a least width of about three-quarters of a cable with a least depth of 2 fathoms ($3^{m}7$). Estagno island (*Lat. 17° 21′ N., Long. 122° 23′ E.*), 225 feet ($68^{m}6$) high, is fringed by a coral reef and a bank, with a depth of less than 5 fathoms ($9^{m}1$) over it, extending three-quarters of a mile northward. The shores of the port are steep and densely wooded. Small craft with local knowledge may obtain good shelter here, but at times there are heavy tide-rips and strong currents in the entrance.

The coast from Estagno island to Aubarede point, 6¾ miles south-south-eastward, is fringed with a reef extending half a mile offshore, and 1¼ cables from the point.

Port Bicobian.—Dangers.—Port Bicobian (Bikobian) is an inlet extending about 2½ miles northward from Aubarede point. The hills rise steeply from its shores, which are fringed by extensive coral reefs which are steep-to, but are not always discernible by discoloration. On the western side of the fairway in the entrance is a detached reef which dries, and on the reef fringing the western shore about one mile west-north-westward of Aubarede point, is a rock which dries about 5 feet ($1^{m}5$).

Vessels with local knowledge may obtain anchorage, in a depth of 10 fathoms ($18^{m}3$), mud, about 2¼ cables from the eastern shore, and about 1½ miles north-north-westward of Aubarede point. Anchorage may also be obtained by small vessels about 6 cables from the head of the port, in a depth of 4½ fathoms ($8^{m}2$), mud, completely protected by the reef extending from the western shore. When approaching the latter anchorage the eastern shore should be favoured as the fringing reef does not extend so far as from the western shore, and Sandy point, about 2 miles northward of Aubarede point, is steep-to.

Coast.—Palanan bay is entered between Aubarede point and Palanan point, 7 miles south-south-eastward. The latter may be identified by Ditolong peak, 1,055 feet ($321^{m}6$), high, wooded and conical, 2½ miles south-south-westward. A reef extends from Palanan point, which should not be approached within one mile. Palanan river, which is navigable by small boats at high water to the town of Palanan, discharges into the southern side of the bay, and about half a mile northward of its mouth there is a reef which extends about half a mile offshore, under the lee of which vessels with local knowledge may obtain a fair anchorage, protected from the sea. There is a wide sandy beach on the southern shore. There are strong tidal streams and heavy tide-rips off Palanan point. Ditolong point is a knoll covered with grass, situated about 3 miles southward of Palanan point.

Between Palanan point and Cape San Ildefonso (chart 3806), about 74 miles south-south-westward, the coast is mostly steep, with wooded hills, rising sharply from bare cliffs, backed by a massive mountain range, and is indented by many shallow bays. There are numerous

Chart 3805.

coral heads inside the 10-fathom ($18^{m}3$) line, with little or no indication of their existence, so that caution is necessary when approaching this coast.

A current setting north-north-eastward, at a rate of 2 knots, parallel with the general trend of the coast, has been observed during the South-west monsoon.

Disumangit point (*Lat. 17° 02′ N., Long. 122° 31′ E.*), about 6 miles southward of Palanan point, is a rocky and cliffy headland, with a prominent off-lying pinnacle. The Knobs, a peculiar mass of scattered hills, covered with trees and of volcanic origin, lie about one mile inland about 5½ miles south-south-westward of Disumangit point; it is the most prominent mark on the coast between Palanan point and Dijohan point (page 508).

Digollorin point lies about 9½ miles southward of Disumangit point. A 1¼-fathom ($2^{m}3$) patch lies about three-quarters of a mile northward of Digollorin point and about half a mile offshore. Digollorin river discharges into the bay of the same name about 3¾ miles south-south-westward of Digollorin point. There is a depth of about one fathom ($1^{m}8$) in the entrance at high water, and an estimated depth of 2 fathoms ($3^{m}7$) just inside. A rock, 10 feet ($3^{m}0$) high, lies about three-quarters of a mile eastward of the northern entrance point of the river. Diviuisa point lies 5¾ miles south-south-westward of Digollorin point. Close off the point is a prominent pinnacle, 210 feet ($64^{m}0$) high.

Charts 3805, 3806.

Dinatadmo point, about 12 miles south-south-westward of Diviuisa point, is low and covered with bushes, and is not distinguishable except from close offshore. Dinapiqui (Dinapiki) point, about 7 miles south-south-westward of Dinatadmo point, is the southern limit of the high cliffy coast which characterises the stretch of coast from Palanan point. The coast southward of Dinapiqui point is generally low, densely wooded, and bordered with sandy beaches.

Diapitan bay.—Diapitan bay is entered between Tarigtig point, situated about 6½ miles south-south-westward of Dinapiqui point, and a point about 1¾ miles north-north-westward. Tarigtig point has a bold rocky cliff on its seaward side and off its end is a bare, rocky islet. A shoal, with a depth of 2¾ fathoms ($5^{m}0$) over it, lies nearly in the middle of the entrance, one mile westward of Tarigtig point, and foul ground extends about a quarter of a mile northward from Tarigtig point. On the eastern side of the bay, about one mile south-south-westward of Tarigtig point are two detached rocks, awash, the outer one lying about half a mile offshore. There is a sandy beach at the head of the bay, which is backed by flat, wooded land.

Anchorages.—Good anchorage may be obtained, in a depth of about 8 fathoms ($14^{m}6$), in the middle of the bay half a mile south-westward of the 2¾-fathom ($5^{m}0$) shoal. Vessels proceeding to this anchorage should pass westward of the shoal. Anchorage may also be obtained, in depths of from 4 to 5 fathoms ($7^{m}3$ to $9^{m}1$), mud, with good holding ground, in the south-eastern part of the bay southward of the two detached rocks, where there is good shelter from the sea.

Chart 3806.

Casapsapan bay. — Dangers. — Casapsapan (Kasapsapan) bay, entered between Dijohan point, situated 7 miles southward of Tarigtig

Chart 1263.

Chart 3806.

point, and a point 2¾ miles north-north-westward, affords little or no shelter during the North-east monsoon. Dijohan point, the north-eastern extremity of San Ildefonso peninsula, may be identified by the bold rocky cliffs on the seaward side, and off its end is a small, bare, rocky islet. The land in the vicinity of the bay is densely wooded.

A shoal, with a depth of 3½ fathoms (6^{m}4) over it, lies about one mile northward of Dijohan point (*Lat. 16° 19′ N., Long. 122° 14′ E.*). About three-quarters of a mile west-north-westward of the point is the northern end of a shoal with a least depth of 3¾ fathoms (6^{m}9) over it, which lies parallel with the eastern shore of the bay. Several detached shoals lie within half a mile of the western shore.

Charts 3475, plan of Casiguran sound, 3806.

Coast.—The eastern side of San Ildefonso peninsula, which lies between Dijohan point and Cape San Ildefonso, the southern extremity, rises steeply. Baltimore peak, about 4 miles from the southern end of the peninsula, is 2,120 feet (646^{m}2) high and prominent. From northward or southward it appears double-topped, but from south-eastward it shows as a sharp peak. The point about 6 miles north-eastward of the cape is covered with grass and is also prominent. There are several dangers close inshore, otherwise this coast is steep-to.

Chart 3475, plan of Casiguran sound.

Casiguran sound and bay.—Dangers.—Casiguran sound is entered westward of Cape San Ildefonso. It extends about 11 miles north-eastward to the entrance to Casiguran bay, a landlocked basin extending about 5 miles farther northward. The south-eastern shore of the sound is steep-to and clear of dangers except for a shoal, with a least depth of 28 feet (8^{m}5) over it, lying about three-quarters of a mile northward of Cape San Ildefonso and 4 cables offshore; a rocky shoal, with a depth of 15 feet (4^{m}6) at its outer end, extending about 3 cables from the eastern shore about one mile northward of the cape; and a detached shoal, with a least depth of 3 feet (0^{m}9) over it, situated 8½ cables south-south-eastward of Motiong point, the western entrance point of Casiguran bay, and about 3 cables from the eastern shore. A bank, with depths of less than 3 fathoms (5^{m}5) over it, extends from about 1¾ to 6 cables from the north-western shore. A detached shoal, with a least depth of 4 feet (1^{m}2) over it, lies about 3½ cables from the north-western shore, about 10 miles west-south-westward of Motiong point.

A shoal, with a depth of 21 feet (6^{m}4) over it, lies on the north-western side of the sound about 4¼ miles west-south-westward of Motiong point, and 1¼ miles offshore.

Vessels navigating the sound should not get into depths of less than 20 fathoms (36^{m}6), as the depths decrease rapidly near the shore in many places.

The entrance to Casiguran bay is 6½ cables wide and deep in the fairway. Wheeling peak, 849 feet (258^{m}8) high, lies on the eastern side of the entrance to the bay, about half a mile inland; it usually shows plainly against the higher hills in the background. The middle of the bay is deep, with a soft clay or mud bottom. A shoal, with a depth of 22 feet (6^{m}7) over it, extends about one cable eastward from Motiong point, and a detached shoal, with a least depth of 7 feet (2^{m}1) over it, lies 4 cables from the north-western shore, about 3 miles northward of Motiong point. The land at the head of the bay is low and

Chart 1263.

Chart 3475, plan of Casiguran sound.

densely wooded. A bank, which is steep-to, with depths of less than 3 fathoms ($5^{m}5$) over it, extends 6 cables from the head of the bay. The town of Casiguran (*Lat. 16° 17′ N., Long. 122° 07′ E.*) is situated about 1¼ miles northward of the head of the bay, from which it is not visible. There is a concrete pier, with a depth of 20 feet ($6^{m}1$) at its head, at Casiguran.

Anchorages. — Directions. — Anchorage may be obtained off the north-western shore of Casiguran sound in many places, in a depth of 20 fathoms ($36^{m}6$).

The best anchorage in Casiguran bay is in the north-western part, in a depth of about 15 fathoms ($27^{m}4$).

A vessel on entering Casiguran sound, should give the south-eastern shore a berth of about one mile until abreast Baltimore peak, when she should steer for Wheeling peak, and if proceeding into Casiguran bay keep in mid-channel in the entrance.

Current.—Tidal streams.—A south-west-going current sets along the eastern side of San Ildefonso peninsula, at a rate of about one knot, unless there is a strong southerly wind, when the direction is reversed.

In Casiguran sound the tidal streams along the eastern shore are fairly strong, a rate of 1¼ knots having been observed about one mile northward of Cape San Ildefonso; on the western side of the sound the streams are weak.

Radio station.—There is a radio station at Casiguran. *See* page 14.

Chart 3806.

Coast.—Dangers.—About 12½ miles westward of Cape San Ildefonso is Debutunan point, about 1¼ miles south-south-westward of which is a rock which dries. Strong tidal streams run off this point. Rinabasan cove lies about 10 miles south-westward of Debutunan point. A 4¾-fathom ($8^{m}7$) patch lies about 1½ miles offshore and 4½ miles north-eastward of Delgada point, the southern entrance point of Rinabasan cove. A rock, 16 feet ($4^{m}9$) high, lies about half a mile eastward of the high point situated about 2¼ miles north-eastward of Delgada point. Small craft with local knowledge may obtain anchorage, in a depth of 7 fathoms ($12^{m}8$), on the southern side of Rinabasan cove.

Baler bay. — Light. — Danger. — Baler bay is entered between Delgada point and Cape Encanto, 13 miles southward. The bay may be identified by the high land round the shores and extending north-eastward as far as Casiguran bay. Close off the north-eastern side of Cape Encanto is Anao islet, 227 feet ($69^{m}2$) high, and about half a mile north-eastward of the islet is Los Confites reef, which breaks, with a bank, with a depth of 3¾ fathoms ($6^{m}9$) over it, extending nearly half a mile north-eastward from it; the outer edge of the bank lies about 1½ miles offshore. There is a deep channel between the reef and Anao islet. The cape is bordered by other rocks which extend about half a mile offshore.

Baler river discharges into the southern end of the bay, and the town of Baler, which had, in 1939, a population of about 2,000, is situated about one mile from the mouth, but is not visible when approaching the anchorage.

A light is exhibited, from a white concrete tower, at Baler (*Lat. 15° 45′ N., Long. 121° 34′ E.*), about three-quarters of a cable from the beach.

Chart 1263.

Chart 3806.

Anchorages.—Anchorage may be obtained by vessels with local knowledge, in depths of from 8 to 10 fathoms (14^{m}6 to 18^{m}3), sand and rock, with the entrance to Baler river open, bearing 180°. The holding ground is poor. Small craft may anchor, in a depth of about 5 fathoms (9^{m}1), with partial protection, in Port Aurora, a cove on the eastern side of Baler point, situated about 2 cables east-north-eastward of the entrance to Baler river.

Radio station.—There is a radio station at Baler. *See* page 14.

Coast.—Between Cape Encanto and Agria point, about 25 miles south-south-westward, the coast is rugged and densely wooded. Numerous islets and large rocks, varying from a few feet to 100 feet (30^{m}5) in elevation, lie close offshore.

Between Disucsip point, situated about 1¾ miles southward of Cape Encanto, and Salaysay point, about 3 miles south-south-westward of the former point, is the entrance to Dibut bay. At the south-western end of the bay there is a bight, the shores of which are fringed by a reef extending 1¼ cables off in places. Anchorage may be obtained by vessels with local knowledge in this bight, in a depth of about 8 fathoms (14^{m}6), about 6½ cables from the head. Between Salaysay point and Dicapanisan (Dikapanisan) point, 8½ miles south-south-westward, several islets lie within three-quarters of a mile of the coast, the highest of which, situated about one mile northward of the latter point, is 128 feet (39^{m}0) high. A 5¾-fathom (10^{m}5) patch lies in the south-eastern approach to Dibayabay bay, 1¾ miles south-south-westward of Salaysay point. Egg islets, 98 feet (29^{m}9) high, lie 4½ miles south-westward of Salaysay point.

Dingalan bay is entered between Agria point and Deseada point, a rugged point, 550 feet (167^{m}6) high, about 11½ miles south-south-eastward. Agria point is 510 feet (155^{m}4) high, and bare. A shoal, with a depth of about one foot (0^{m}3) at its outer end, extends 2¾ cables from the western shore of the bay, 4 miles south-westward of Agria point. Umiray river discharges into the bay about 4½ miles north-westward of Deseada point. There is a well defined white stripe on the hill sloping to the beach, about 5 or 6 miles southward of Deseada point (*Lat. 15° 11′ N., Long. 121° 29′ E.*).

Anchorage may be obtained by vessels with local knowledge in the northern part of Dingalan bay, sheltered from north-easterly winds, in depths of from 3 to 9 fathoms (5^{m}5 to 16^{m}5). The coast between Deseada point and Prueba point, 13¾ miles south-south-eastward, is marked by densely wooded ranges of mountains running parallel with the coast. The coast is fronted by a reef which is steep-to, with numerous black pinnacle rocks between the reef and the coast. Prueba point is low and difficult to identify.

Polillo strait. — Dangers. — Polillo strait, between the east coast of Luzon and Polillo island, has a least width of 10 miles, and is deep in the fairway.

Prueba rock is a low rock rising from a steep-to coral reef, situated about 1½ miles from the coast of Luzon, about 15 miles south-south-eastward of Deseada point. A 1¼-fathom (2^{m}3) patch lies close north-westward of Prueba rock.

Marcelino point, about 7½ miles south-south-eastward of Prueba rock, is high and prominent. About 5½ miles farther south-eastward is the mouth of Agos river, and about 1½ miles southward of which and

Chart 1263.

Chart 3806.

1¼ miles inland is the town of Infanta. From the mouth of Agos river to Dinahican (Dinahikan) point, 6½ miles south-eastward, the coast is sandy. Dinahican point is low, densely wooded with trees, about 50 feet ($15^{m}2$) high, and steep-to. There are tide-rips and much discoloured water off the point, which might be taken for a reef; the depths, however, are considerable.

Vessels with local knowledge may obtain good anchorage during the South-west monsoon about 1¼ miles south-eastward of the mouth of Agos river, about half a mile offshore, in depths of from 6 to 8 fathoms ($11^{m}0$ to $14^{m}6$). This anchorage, however, is obstructed by snags brought down the river by floods. Infanta is best reached by anchoring in Port Lampon (page 514).

Radio station.—There is a radio station at Infanta. *See* page 14.

POLILLO ISLAND.—Polillo island is hilly and well wooded. Mount Malolo, 1,130 feet ($344^{m}4$) high, the summit of the island, lies about 10 miles northward of the southern extremity. It is the most prominent landmark, and is the first object seen when approaching the island from eastward or north-eastward.

Western side of Polillo island. — Dangers. — Buoys. — Panampalan point (*Lat. 15° 03′ N., Long. 121° 50′ E.*), the north-western extremity of Polillo island, is the termination of a low mangrove area, from which a coral reef, which partly dries, extends about 1½ miles northward. There is an intricate channel, encumbered by shoals, through this reef, about 3¼ cables northward of the edge of the mangroves. The point may be identified by a round-topped tree, 58 feet ($17^{m}7$) high, on the eastern side and a conical-topped clump of trees, 60 feet ($18^{m}3$) high, on the western side.

A detached shoal, with a depth of 1¾ fathoms ($3^{m}2$) over it, lies about 1½ miles westward of the point, and a shoal, with a depth of 1¼ fathoms ($2^{m}3$) over it, lies 2 miles south-westward of this point.

Lipata river, which discharges about 1¾ miles southward of Panampalan point, has fairly uniform depths of from 1½ to 2 fathoms ($2^{m}7$ to $3^{m}7$) for a distance of 5½ miles. The rocky parts of the banks of the river are heavily wooded. Pinagagan river discharges close southward of Lipata river; the entrance between the reefs is about half a cable wide. Panangatan point, about 5 miles southward of the entrance to Pinagagan river, is prominent, steep-to and clear of dangers; the coast northward of it is bordered by rocks.

Hook bay is a small harbour of refuge, entered about one mile eastward of Panangatan point. It affords excellent protection for small vessels with local knowledge, being backed by high hills and is completely landlocked. When approaching from southward the entrance, which is about 1¾ cables wide, is easily picked up, as the headland on the eastern side of the entrance is high and clearly defined against the background. Both sides of the entrance are fringed by well-marked coral reefs, which dry, which narrow the channel to a width of less than one cable.

A vessel entering Hook bay should keep in mid-channel, steering about 001°; when the narrows are passed she should steer up the middle of the bay and anchor in the widest part about 3½ cables south-eastward of Elbow point, situated about 1¼ miles northward of the western entrance point, in a depth of about 10 fathoms ($18^{m}3$), mud.

Chart 1263.

Chart 3806.

There is also anchorage for small craft in the north-western arm of the bay, north-westward of Elbow point, in a depth of 8 fathoms ($14^{m}6$), mud.

Good anchorage may be obtained by vessels with local knowledge in the middle of the small bay westward of the western entrance point of Hook bay, in a depth of 15 fathoms ($27^{m}4$), mud, with the western entrance point of Hook bay bearing 091°, distant about half a mile.

From the entrance to Hook bay to Malagas point (*Lat. 14° 46′ N., Long. 121° 55′ E.*), the northern entrance point of Polillo bay, 11½ miles southward, the coast is fringed by a narrow, steep-to coral reef. About three-quarters of a mile south-westward of Abuigoin point, about 2½ miles south-south-eastward of the eastern entrance point of Hook bay, there is a reef, with a depth of one fathom ($1^{m}8$) over it, and about 3½ cables south-westward of Salipsip point, 5½ miles south-south-eastward of Abuigoin point, there is a shoal, with a depth of 1½ fathoms ($2^{m}7$) over it. A reef, with a rock, awash at its outer end, extends about 4 cables north-westward from Tumulaya point, 3 miles south-south-eastward of Salipsip point.

Yellow rock, with a depth of 1¼ fathoms ($2^{m}3$) over it, and on which the sea breaks, lies on the north-western edge of a bank which extends about 5½ miles north-westward from Polillo point, the western entrance point of Polillo harbour, and 2¼ miles south-south-westward of Malagas point. A 2¼-fathom ($4^{m}1$) patch lies about one mile eastward of Yellow rock. A can buoy, painted yellow with a white horizontal band, is moored close south-eastward of Yellow rock.

Union reef, with a least depth of 1¼ fathoms ($2^{m}3$) over it, lies about 4 miles north-westward of Polillo point, and near the south-western edge of the bank. A can buoy, painted yellow, with a white horizontal band, is moored close south-eastward of Union reef. There are other dangers between Union reef and Polillo point, and a 3½-fathom ($6^{m}4$) patch lies about 2¾ miles north-westward of the point.

Agta point, the southern extremity of Polillo island, is low, densely wooded, and fringed by a narrow, steep-to reef. From a position about one mile north-westward of the point a bank, with a depth of 2 fathoms ($3^{m}7$) over it, extends about half a mile offshore, and a detached shoal, with a depth of 1¾ fathoms ($3^{m}2$) over it, lies nearly 1½ miles south-westward of the latter point.

Two 6½-fathom ($11^{m}9$) patches lie about 2¾ miles south-south-westward and southward, respectively, of Agta point.

Chart 3475, plan of Polillo harbour.

Polillo harbour. — Lights. — Dangers. — Buoys. — Polillo harbour is formed between Polillo reef, which dries, extending about 2 miles northward from Polillo point, and the coast of Polillo island. The reef is mostly steep-to and is marked by breakers and discoloration. Its northern extremity is marked by a can buoy, painted yellow with a white horizontal band. The head of the harbour is foul, and there are a number of small detached shoals lying within half a mile of the eastern shore, from one to 1¾ miles southward of Malagas point; the shoalest and southern patch, with a least depth of 4 feet ($1^{m}2$) over it, which is marked on its south-western side by a can buoy, painted yellow with a white horizontal band, can easily be distinguished by the colour of the water, but the others cannot be detected unless directly over them. A 9-foot ($2^{m}7$) patch lies in the middle of the harbour between Polillo point and the town of Polillo, and a rock, with a depth

Charts 943, 1263.

Chart 3475, plan of Polillo harbour.

of less than 6 feet ($1^{m}8$) over it, lies about 3½ cables south-eastward of it. There is discoloured water at the entrance to the harbour, due to the discharge from small streams in the vicinity.

Polillo is a small unimportant town on the eastern side of the harbour. It is surrounded by a dilapidated wall, overgrown by shrubbery. The church has an octagonal tower with a metal roof, and is visible from a considerable distance.

There is a concrete pier, which had, in 1938, a least depth of 19 feet ($5^{m}8$) alongside its western face, and 13 feet ($4^{m}0$) alongside the inner face. Water is laid on to the pier.

There are two leading lights situated on the eastern side of the harbour about 2¾ miles south-south-eastward of Malagas point (*Lat. 14° 43′ N., Long. 121° 56′ E.*). The front light is exhibited, at an elevation of 30 feet ($9^{m}1$), from a post surmounted by a white triangular shape, point up, on the beach; the rear light is exhibited, at an elevation of 57 feet ($17^{m}4$), from a small platform on the church tower, about 1¾ cables south-eastward of the front light.

Charts 3475, plan of Polillo harbour, 3806.

Anchorage.—Directions.—Anchorage may be obtained by vessels with local knowledge, in a depth of 9 fathoms ($16^{m}5$), about 3 cables westward of the church at Polillo.

A vessel approaching Polillo harbour from southward should not bring Panangatan point to bear less than 001° until Mount Malolo bears 097°, when she should steer for it on that bearing until the leading light-structures are in line, bearing 145°, when she should alter course to this alignment, keeping a good lookout for the shoals on either side; when Polillo point is abeam she should alter course to 154°, which will lead to the anchorage.

Chart 3806.

Northern and eastern sides of Polillo island.—Coast.—The north coast of Polillo island is fringed by a wide, steep-to, coral reef, in which there are several breaks, forming small bays, which do not afford good anchorage. About 3 miles inland there are several hills, from 300 to 600 feet ($91^{m}4$ to $182^{m}9$) high. Pinavisagan bay, at the north-eastern extremity of the island, affords some protection from westward and southward to vessels with local knowledge. Minayit point, the north-eastern extremity of the island, is a brown rocky bluff, 58 feet ($17^{m}7$) high, and bare of trees, and is easily identified.

About 3¼ miles southward of Minayit point is Banla point, the eastern entrance point of Anibawan bay, which is about 2½ miles wide at its entrance. Buguitai islet, 78 feet ($23^{m}8$) high, lies on a reef about 4 cables south-eastward of Banla point. About three-quarters of a mile west-south-westward of Banla point there is a rock, with a depth of 3 feet ($0^{m}9$) over it, and about one mile north-westward of the point there is a shoal, with a least depth of 2¼ fathoms ($4^{m}1$) over it. Anibawan bay affords a well-protected anchorage for vessels with local knowledge, in a depth of about 20 fathoms ($36^{m}6$).

Burdeos bay is formed by the eastern coast of Polillo island on the west by Palasan island, 4½ miles southward of Banla point, on the north, and Patnanongan and several smaller islands on the east. In it there is a large area available for anchorage of vessels with local knowledge, well protected from all winds. The southern approach is encumbered with numerous shoals and reefs, through which there are

Charts 943, 1263.

Chart 3806.

several tortuous channels. The tidal streams amongst the reefs are strong. Burdeos bay may also be entered from northward, but the channel is narrow and encumbered with reefs.

Off-lying islands and dangers.—A chain of islands, the largest of which are Palasan and Patnanongan islands, extends about 18 miles south-eastward from the north-eastern part of Polillo island. Uala islands lie on an extensive reef separated from the northern side of Patnanongan island by a narrow tortuous channel impracticable for a small boat at low water. Palasan island, 222 feet ($67^{m}7$) high, is fringed by a wide coral reef except on its western side. Patnanongan island, 279 feet ($85^{m}0$) high, and densely wooded, is bordered with mangroves and fringed with coral reefs. Catakian (Katakian) Grande island (*Lat. 14° 49′ N., Long. 122° 15′ E.*), 112 feet ($34^{m}1$) high, and Catakian Chica islet, 96 feet ($29^{m}3$) high, lie on the western side of a reef lying close off the north-eastern side of Patnanongan island.

Jomalig (Homalig) island, low and heavily wooded, is separated from the south-eastern end of Patnanongan island by a channel, in which there is a least depth of 5 fathoms ($9^{m}1$) in the fairway, and a least width of 2¾ miles. The island is fringed by a coral reef, which dries, extending about three-quarters of a mile from the eastern end. The western end of the island is moderately high, the tops of the trees being about 100 feet ($30^{m}5$) high.

Malanat islets are a group of three islets and several rocks lying on the reef fringing the eastern end of Jomalig island. The islets are wooded, and the highest has an elevation of 56 feet ($17^{m}1$). Lantao rock, 8 feet ($2^{m}4$) high and bare, lies on the eastern edge of a reef which dries, about 1½ miles east-north-eastward of the north-eastern point of Jomalig island. Lantao islets are two bare, rocky islets of whitish appearance, the larger of which is 150 feet ($45^{m}7$) high, lying about 2½ miles north-eastward of Lantao rock. There are several rocks awash eastward and north-eastward of Lantao rock.

Several shoals, with a depth of 6 fathoms ($11^{m}0$) at the outer end, extend about 20 miles eastward of East Ikikon island, 49 feet ($14^{m}9$) high, situated 3 miles north-eastward of the north-eastern extremity of Patnanongan island. A 2½-fathom ($4^{m}6$) patch lies 5¼ miles eastward of East Ikikon island, and several shoals, with depths of from 3¾ to 5½ fathoms ($6^{m}9$ to $10^{m}1$) over them, lie within 6½ miles east-south-eastward of the same island.

LAMON BAY.—Danger.—Lamon bay, entered between Dinahican point (page 511) and Jesus point, 51 miles south-eastward, is partly protected during the North-east monsoon by Polillo and its off-lying islands.

Balesin island, 78 feet ($23^{m}8$) high to the tops of the trees, lies near the middle of the bay. Its north-western, northern, and north-eastern sides are fringed with reefs which dry, and shoals, with depths of from 1¼ to 4½ fathoms ($2^{m}3$ to $8^{m}2$) over them, extend about 2¼ miles westward from it.

Tarlac (Tarlak) reef, with a depth of 4¼ fathoms ($7^{m}8$) over it, lies about 1¾ miles south-south-westward of the southern extremity of Balesin island.

Western side of Lamon bay.—Port Lampon.—Port Lampon, situated in the north-western part of Lamon bay, is a well-sheltered

Charts 943, 1263.

Chart 3806.

inlet, except during south-easterly and southerly winds. It is entered westward of Tacligan (Takligan) point, which lies about 6½ miles west-south-westward of Dinahican point. There are depths of from 11 to 13 fathoms ($20^{m}1$ to $23^{m}8$), sand and mud, on the eastern side of the entrance, decreasing gradually to 1¼ fathoms ($2^{m}3$) westward of Orista island, about 7 cables north-north-westward of Tacligan point (*Lat. 14° 40′ N., Long. 121° 37′ E.*). Pulo river, which discharges into the head of the port, is navigable for small craft for a distance of 2½ miles as far as the village of Pulo. There are several training walls at the mouth of the river, forming a channel with a least depth of 3½ fathoms ($6^{m}4$). There is a pier at Puerto Real, on the western entrance point; in 1938, there was a depth of 19 feet ($5^{m}8$) alongside. The out-going stream has a rate of from 3 to 4 knots off the head of the pier.

Good anchorage may be obtained, in depths of from 5 to 7 fathoms ($9^{m}1$ to $12^{m}8$), north-westward of Tacligan point.

Coast.—The coast southward of Port Lampon is bold and densely wooded. Magasawang rock, 40 feet ($12^{m}2$) high, lies about 13 miles southward of Tacligan point and about a quarter of a mile offshore, to which it is connected by a reef which dries; a reef extends over 1½ cables eastward from the rock. About 3½ miles southward of Magasawang rock are two prominent waterfalls, and another 5½ miles farther south-eastward. Saley point, about 14 miles south-eastward of Magasawang rock, is high, well wooded and steep-to.

Chart 1622, plan of Mauban bay.

Malazor point, about 2 miles southward of Saley point, is low and terminates in a wooded knoll. A coral reef extends over half a cable eastward and southward from the point.

Mauban anchorage.—Mauban anchorage is situated off the town of Mauban about 1½ miles south-westward of Malazor point.

The town is of little commercial importance, copra being the only article exported. The most prominent object in the town is a large galvanised iron church, resembling a grain elevator, standing in the south-western part alongside the ruins of an old stone church. At the northern end of the town there is a mole extending south-eastward, with a depth of 10 feet ($3^{m}0$) at its outer end, where landing can be effected.

Anchorage may be obtained, in a depth of 6 fathoms ($11^{m}0$), mud, with the church bearing 288°, and Malazor point, 031°.

Chart 3806.

Coast.—Storm signals.—Between Mauban and the town of Antimonan, about 16 miles south-eastward, the coast is steep-to, and mostly bordered with sandy beaches and coconut trees, backed by wooded mountains, over 1,700 feet ($518^{m}2$) high, within 1½ miles of the coast. Twin peaks, 3¾ and 4½ miles north-westward of Antimonan, and about 1¼ miles inland, 1,279 and 1,241 feet ($389^{m}9$ and $378^{m}3$) high, respectively, are prominent.

Antimonan, the principal town in this vicinity, and a regular port of call for coasting steamers, stands on the south-eastern bank at the mouth of Antimonan river. It contains a church, the tower of which, resembling a white lighthouse, can be seen from a position near the northern end of Alabat island; the remainder of the town is also prominent. A considerable amount of copra and some hemp is exported. The river has a depth of from 7 to 9 feet ($2^{m}1$ to $2^{m}7$) on its bar at high water.

Charts 943, 1263.

Chart 3806.

Anchorage may be obtained by vessels with local knowledge off the river mouth, in a depth of 10 fathoms (18^m3), mud, with the church bearing 180°. Small vessels may anchor closer in, but they should not go inside a depth of 6 fathoms (11^m0), as there the depths decrease rapidly and the holding ground of hard sand is poor. During the North-east monsoon this anchorage is sometimes untenable ; vessels then seek refuge at Port Alabat or Sangirin bay, on the south-western side of Alabat island.

Storm signals are shown from a mast at the observatory near the beach in front of the church at Antimonan. *See* page 11.

From Antimonan to Laguio point (*Lat. 13° 55′ N., Long. 122° 07′ E.*), 12½ miles south-eastward, the coast is fringed by a narrow reef, and may be approached to a distance of half a mile. The village of Siain, 6 miles south-eastward of Antimonan, is a shipping place for copra and hemp. There is a pier, with a depth of 8 feet (2^m4) at its head. The town of Gumaca (Gumaka) is situated at the head of a small bight about one mile westward of Laguio point. Anchorage may be obtained by vessels with local knowledge, in a depth of 17 fathoms (31^m1), about one mile off the town. The railway from Tayabas bay (page 369) reaches the coast at Gamau point, close south-eastward of Siain, thence running along the southern shore of Lopez bay to the town of Lopez, thence northward to the town of Hondagua, thence eastward to Aloneros at the head of Ragay gulf (page 386).

Islands.—Light.—Cabalete (Kabalete) island, 170 feet (51^m8) high, and densely wooded, lies 3¼ miles north-eastward of Saley point. Reefs extend 1¼ miles from the south-eastern side of the island, and a bank, with depths of less than 5 fathoms (9^m1) over it, extends nearly 2½ miles from the same side ; the remainder of the island is fringed by reefs extending from one to 3½ cables offshore. The channel between Cabalete island and the western shore of Lamon bay is 2½ miles wide between the dangers extending from the western side of Cabalete island and Saley point, with considerable depths in the fairway. Vessels using this channel are recommended to favour the Luzon shore.

Baliscan (Baliskan) islet, 4 miles south-eastward of Cabalete island, is a flat-topped rock, 20 feet (6^m1) high and bare of vegetation. It is steep-to, except on its south-western side, from which a reef, with a depth of 4½ fathoms (8^m2) over it, extends about half a mile.

A light is exhibited, at an elevation of 55 feet (16^m8), from a white concrete pillar, on Baliscan islet.

Alabat island lies with Gerardo point, its northern extremity, 6½ miles eastward of Pedro point, the southern extremity of Cabalete island. The island is densely wooded and has a ridge running its whole length, with five peaks, the highest of which, situated 7¾ miles south-eastward of Gerardo point, is Mount Camagong, with an elevation of 1,384 feet (421^m8) ; from a distance these peaks resemble islands.

Gerardo point is fringed by a narrow reef, thence to Sangirin point, about 3 miles south-south-westward, a coral reef extends from one to 4½ cables offshore ; off Sangirin point it extends about 2¾ cables south-westward.

Sangirin bay.—Light.—Sangirin bay, lying eastward of Sangirin point, affords a small, well-sheltered anchorage for vessels with local knowledge, in depths of 7 or 8 fathoms (12^m8 or 14^m6), mud. The land forming Sangirin point and that around the bay is low. The

Charts 943, 1263.

Chart 3806.

bay is protected by two reefs which dry, the outer of which lies about half a mile south-south-eastward of Sangirin point. Perez (Sangirin) village stands on the eastern side of the bay.

A light is exhibited, at an elevation of 33 feet ($10^{m}1$), from a white concrete beacon, near the beach of the southern part of Perez.

A vessel should approach Sangirin bay with the church, situated in the south-eastern part of the village, bearing 046°; after rounding the western entrance point she should anchor with the church bearing about 066°, distant about 3½ cables. Small craft may anchor about 1¼ cables from the head of the bay, in a depth of about 6 fathoms ($11^{m}0$).

Chart 3475, plan of Port Alabat.

Port Alabat. — Light. — Port Alabat, entered about 7 miles south-eastward of Sangirin point (*Lat. 14° 11′ N., Long. 121° 55′ E.*), has accommodation for a few small vessels; it affords excellent shelter from northward and eastward, but is not recommended as a typhoon anchorage. The entrance is about one mile wide. A reef of rocks and sand extends 3 cables southward from the north-western entrance point and 6 cables westward from the south-eastern entrance point, leaving a deep channel, 2¾ cables wide, between them into the port. These reefs are visible at low water. The shore of the port is low, with an extensive sand beach.

The town of Alabat is situated on the eastern side of the port.

A wooden pier, 70 feet ($21^{m}3$) long, affords berthing accommodation for small craft.

A light is exhibited, at an elevation of 35 feet ($10^{m}7$), from a white concrete beacon, on the beach at Alabat.

Vessels should approach the anchorage with the light-beacon bearing 060°; shoals on either side are usually marked by fishing stakes.

Chart 3806.

North-eastern side of Alabat island.—The north-eastern side of Alabat island is steep-to and clear of off-lying dangers. Pasig rock, 117 feet ($35^{m}7$) high, lies close offshore, midway between Gerardo point and Silangan point, the south-eastern extremity of the island.

Charts 3475, plan of Hondagua harbour, 3806.

Lopez bay. — Danger. — Buoy. — Lopez bay is entered between Laguio point (page 516) and Roma point, about 5½ miles north-eastward. The latter point is the north-western extremity of a peninsula separating Lopez and Calauag (Kalauag) bays, covered with densely wooded hills, from 200 to 500 feet ($61^{m}0$ to $152^{m}4$) high.

Chart 3475, plan of Hondagua harbour.

The head of the bay and the north-eastern shore are fringed by extensive coral reefs; on the north-eastern shore reefs are Manicnic, Nagtaquin and Niogan islets, 27, 75 and 80 feet ($8^{m}2$, $22^{m}9$ and $24^{m}4$) high, respectively, lying from 2¼ to 3½ miles south-eastward of Roma point.

About 1¼ miles from the head of the bay is a detached shoal, with a least depth of 1¾ fathoms ($3^{m}2$) over it, marked on its north-western side by a red conical buoy.

Lopez river, which discharges into the head of the bay, is about a quarter of a cable wide at its entrance, and narrows to about 30 yards ($27^{m}4$) near the town of Lopez, about 1¾ miles within the head of the bay.

Anchorage may be obtained in the southern part of the bay, in a

Chart 3475, plan of Hondagua harbour.

depth of about 8 fathoms ($14^{m}6$), mud, about one mile from the entrance to the river.

Hondagua harbour.—Light.—Hondagua harbour, in the north-eastern corner of the head of Lopez bay, affords a secure anchorage for vessels with local knowledge, with good holding ground. It is open to foreign shipping. (*See* page 3.) There is a wharf, with depths of from 15 to 30 feet ($4^{m}6$ to $9^{m}1$) alongside, on the northern side of the harbour. A vessel proceeding alongside should before steering for it pass half a mile southward of Niogan islet. There is a crane with a lifting capacity of 10 tons on the wharf. Water is laid on to the wharf.

A light is exhibited at the head of the wharf. The wharf was reported, in 1947, to be destroyed.

The town of Hondagua (*Lat. 13° 57′ N., Long. 122° 14′ E.*) is connected to the telegraph and to the main railway system of the island, and there is steamer communication with other coastal ports.

Chart 3475, plan of Silangan pass.

Silangan pass. — Light. — Dangers. — Silangan pass, between Roma point and the south-eastern extremity of Alabat island, is about half a mile wide, but the navigable channel is reduced to about 3 cables between the reefs fringing the shore on either side. A reef, with a depth of one foot ($0^{m}3$) near its outer end, extends about half a mile south-westward from a point about 8 cables southward of Roma point. The depths in the pass are very irregular. On the northern side of the western approach there is a shoal, which partly dries, lying about one mile westward of Roma point and about half a mile from the northern shore. A rock, with a depth of 3 fathoms ($5^{m}5$) over it, lies in the middle of the pass about 1¾ cables northward of the light-beacon off Roma point. This is the principal danger in the fairway of the pass, but other isolated rocks may exist. A 2-fathom ($3^{m}7$) patch lies 2½ cables south-eastward of Aguhuc point, situated 5½ cables northward of Roma point.

A light is exhibited, at an elevation of 31 feet ($9^{m}4$), from a white concrete beacon on the outer edge of the reef extending northward from Roma point.

The village of Quezon, which contains a church, is situated on Aguhuc point.

A vessel approaching Silangan pass from westward, should, when about 2 miles from Quezon, steer for the south-eastern tangent of Alabat island, bearing 046°, until Roma point light-beacon bears 088°, when she should steer 068°, which leads close southward of the rock with a depth of 3 fathoms ($5^{m}5$) over it, situated in the middle of the pass.

Chart 3806.

Calauag bay.—Calauag (Kalauag) bay is entered between the south-eastern end of Alabat island and the coast of Luzon north-eastward of it, or through Silangan pass. The south-western shore, south-eastward of Roma point, is fringed by a narrow reef and can be approached within half a mile. The head of the bay is encumbered with mud flats which partly dry and extend about one mile offshore. A narrow boat channel, with a depth of about 2 feet ($0^{m}6$), leads to the town of Calauag (Kalauag), situated on the shore. It is connected to the railway system of the island.

Anchorage may be obtained by vessels with local knowledge,

Charts 943, 1263.

Chart 3806.

sheltered from all except north-westerly winds, in a depth of 5 fathoms ($9^{m}1$), mud, about 1¼ miles north-north-westward of Calauag church.

Apat bay lies in the north-eastern corner of Calauag bay, and is entered between Kugasinan point, 2 miles northward of the town of Calauag, and Dayap point, about 1¾ miles farther northward. The entrance is nearly closed by a reef, which dries, extending south-eastward from Dayap point (*Lat. 14° 01′ N., Long. 122° 17′ E.*). There are two arms, one extending south-eastward and the other north-eastward. Apat island, about 75 feet ($22^{m}9$) high to the tops of the trees, lies in the middle of the entrance to the south-eastern arm. A reef extends about 1½ cables from the western side of the island.

Good anchorage may be obtained by vessels with local knowledge with Apat island bearing 061° and Kugasinan point, 181°, in a depth of about 4 fathoms ($7^{m}3$), mud. Perfectly protected anchorage for small craft may be obtained about three-quarters of a cable south-south-eastward of Apat island, in a depth of about 2 fathoms ($3^{m}7$), mud.

Dayap bay, entered between Dayap point and Pinagsakayan point, about one mile north-westward, is a small inlet encumbered with fringing reefs. At the head of the bay Quezon canal connects with Tabogon river, which discharges into the head of Basiad bay.

The north-eastern shore of Calauag bay is bordered by mangroves and fringed by a reef which extends as much as three-quarters of a mile offshore. A sunken rock lies one mile offshore about 4¼ miles north-westward of Dayap point, and a one-fathom ($1^{m}8$) patch lies about 6 cables north-westward of the rock.

Coast.—Pangao point, 11 miles north-westward of Dayap point, is fringed by a reef which extends nearly 1¾ miles north-westward, and there are depths of from one to 5 fathoms ($1^{m}8$ to $9^{m}1$) about 2 miles farther. Pulupari island, 84 feet ($25^{m}6$) high to the tops of the trees, and fringed with mangroves, lies near the outer edge of the reef. A 4½-fathom ($8^{m}2$) patch lies 2 miles north-westward of the island. A 3¾-fathom ($6^{m}9$) patch lies about 1¼ miles northward of the island, and a 2¼-fathom ($4^{m}1$) patch one mile north-eastward.

San Angel bay, entered between Pangao point and Lagichic (Lagichik) point, about three-quarters of a mile eastward, is shallow. Between the latter point and the western entrance point of Tinig river, 3¾ miles north-eastward, a reef, which dries, extends as much as 3 miles offshore. Between the eastern side of this reef and the western side of a peninsula, of which Dapdap point is the northern extremity, is Tinig bay, into the head of which Tinig river discharges. Dapdap point is densely wooded, and 190 feet ($57^{m}9$) high to the tops of the trees, about three-quarters of a mile within, and is very prominent. It is fringed with a reef, which dries, extending about 3 cables offshore, and a bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends about half a mile northward from the point.

Off-lying shoals.—A shoal, with a depth of 3¼ fathoms ($5^{m}9$) over it, lies in the northern approach to Tinig bay and about 1¾ miles west-north-westward of Dapdap point. Two shoals, with a depth of 5 fathoms ($9^{m}1$) over them, lie 4½ miles westward and 4 miles west-north-westward, respectively, of Dapdap point, and between these two shoals are two others, with depths of 4 and 4¾ fathoms ($7^{m}3$ and $8^{m}7$),

Charts 943, 1263.

Chart 3806.

respectively. A 5¼-fathom (9^{m}6) patch lies 5½ miles north-westward of Dapdap point, and two shoals, with depths of 6½ and 6¼ fathoms (11^{m}9 and 11^{m}4) over them, lie about 4¾ and 5¼ miles, respectively, northward of the same point.

Foul ground, with depths of from 4 to 22 feet (1^{m}2 to 6^{m}7) over it, lies within 2¼ miles north-north-eastward of Dapdap point.

Basiad bay.—Dangers.—Basiad bay is entered between Dapdap point and Mapingil (Puktol) point, on which is a prominent hill, over 200 feet (61^{m}0) high, about 5 miles eastward. The shores are generally fringed with reefs, which dry, extending as much as three-quarters of a mile off, and depths of less than 3 fathoms (5^{m}5) extend nearly one mile offshore. At the head of the bay there is a mud flat which dries, and a bank, part of which dries, extends 2½ miles northward of Bagolayag (Bagolaya) point (*Lat. 14° 08′ N., Long. 122° 18′ E.*), the northern extremity of a peninsula extending from the middle of the head of the bay.

A shoal, with a depth of 5¼ fathoms (9^{m}6) over it, lies about 1¾ miles north-westward of Mapingil point. Several shoals, with depths of from 4 feet to 3¾ fathoms (1^{m}2 to 6^{m}9) over them, lie within 9 cables westward of the same point. A shoal, with a least depth of 1½ feet (0^{m}5) over it, lies 2 miles south-westward of the point, and between this shoal and Dapdap point there are shoals, with depths of from 3 to 5 fathoms (5^{m}5 to 9^{m}1) over them, with deep channels between.

Tabogon (Kabugon) river, which discharges into the head of the bay on the eastern side of Bagolayag point, is the largest river in this vicinity. It has a depth of one fathom (1^{m}8) on its bar eastward of Bagolayag point, and depths of from 2 to 4 fathoms (3^{m}7 to 7^{m}3) inside for a distance of about 4 miles.

Good sheltered anchorage for small vessels with local knowledge may be obtained southward of a reef which dries, situated about 1¼ miles northward of Bagolayag point, in a depth of 3 fathoms (5^{m}5), soft mud. This anchorage may be approached on either side of the drying reef.

The eastern side of Basiad bay is indented by Santol and Tinagong-Dagat bays, separated by Butong point, situated about 1½ miles south-south-westward of Mapingil point; both bays are encumbered with shoals.

Coast.—Light.—From Mapingil point to Jesus point, 11 miles north-eastward, the coast is backed by densely wooded hills, and indented by numerous small bays which are foul and fringed with wide reefs. A shoal, with a depth of 6 fathoms (11^{m}0) over it, lies about 2½ miles north-north-westward of Sagbungon point, situated about 2¾ miles north-north-eastward of Mapingil point. Jaulo island, fringed with mangroves, lies nearly one mile offshore and 4½ miles north-eastward of Sagbungon point; it is connected to the coast by a reef which dries.

About three-quarters of a mile westward of Jesus point is the eastern entrance point of Capalonga bay, from which a reef, with a depth of 3¼ fathoms (5^{m}9) at its outer end, extends about 1¼ miles north-westward. The town of Capalonga (Kapalonga) stands on the western shore of the bay. There is a post office here and there is steamer communication with other ports. The metal roof of the municipal building is prominent.

Charts 943, 1263.

Chart 3806.

A light is exhibited, at an elevation of 32 feet (9^{m}8), from a white concrete tower, on the eastern shore of Capalonga bay.

Alayao river discharges into the head of Capalonga bay.

Jesus point is formed by a round-topped wooded hill, over 100 feet (30^{m}5) high, connected to the mainland by a low neck of mangrove swamp, giving the point the appearance of an island when first seen from eastward or westward. It is fringed by a narrow reef, on which the sea breaks heavily at times.

Off-lying bank.—A coral patch, with a depth of 7 fathoms (12^{m}8) over it, lies about 7 miles north-westward of Jaulo island.

COAST.—Dangers.—Between Jesus point (*Lat. 14° 20′ N.*, *Long. 122° 31′ E.*) and Pinandungan point, 8½ miles eastward, the coast is indented by several bays, and fronted by a number of islands, reefs, and shoals. The coast is high, bluff, and densely wooded.

Mariners not intending to enter any of the bays in this neighbourhood are advised not to approach within a line drawn from 2½ miles northward of Jesus point to a position 2 miles north of Tabusao island, 7½ miles eastward.

A rocky shoal, with a depth of 5¾ fathoms (10^{m}5) over it, lies 2½ miles north-north-eastward of Jesus point.

A reef, which dries, lies 1¾ miles eastward of Jesus point and 3¾ cables offshore. High point, 5½ miles east-south-eastward of Jesus point, is over 100 feet (30^{m}5) high, well wooded, and prominent. The northern and southern sides of the extremity of the point are fringed by a narrow reef, but the eastern end may be passed at a distance of 1½ cables.

Dahikan islands, four in number, lie in the north-western approach to Dahikan bay. Entrance island lies close offshore, about 1½ miles westward of High point. It is 150 feet (45^{m}7) high, well wooded, and is fringed by reefs which fill the channel between it and the mainland. Calalanag island lies about 1¾ miles northward of High point, and is low, well wooded, and fringed by a white sandy beach, except on the northern end, which is composed of black rock. Palita island, lying on a reef, which dries, about 1½ miles north-eastward of High point, is low, wooded, and fringed by a white sandy beach. There are several shoals between Calalanag and Palita islands, and also between Palita and Tabusao islands.

Tabusao island, the north-easternmost of the Dahikan islands, lies about one mile north-north-eastward of Palita island. It is low and wooded, and surrounded by a white sandy beach. A shoal, with a least depth of 2¾ fathoms (5^{m}0) over it, lies about 2 miles north-westward of Tabusao island, with several patches, with depths of 4 feet to 3 fathoms (1^{m}2 to 5^{m}5) over them between, and a bank, with depths of from 3½ to 5 fathoms (6^{m}4 to 9^{m}1) over it, extends nearly 1¼ miles north-north-westward from the island.

Dahikan bay.—Dahikan bay, entered between High point and a low point projecting northward from the mainland, 1¼ miles north-eastward, affords good shelter for a small vessel with local knowledge during typhoon weather, in a bight in the reef southward of High point. The anchorage area is small, but the holding ground is good, and is protected from the sea. There is a mooring buoy in the bay. The head of the bay is shallow and fringed by a reef which dries. The shoals in the vicinity of the pier are marked by piles.

Charts 943, 1263.

Chart 3806.

There is a pier, about 250 feet (76^{m}2) long, on the southern side of High point, and fresh water is laid on to it. A depth of 24 feet (7^{m}3) alongside is maintained by dredging. There is a post and telegraph office here, and there is steamer communication with other ports.

Pilotage is compulsory for merchant vessels. The pilot should be embarked at Jose Panganiban.

Anchorages.—Directions.—To enter Dahikan bay a vessel with local knowledge should steer for High point, bearing 153°, until the northern extremity of Calalanag island bears 077°, when she should steer 145°, passing about midway between Calalanag and Entrance islands. When High point bears 255°, she should alter course south-westward and anchor in a depth of about 4 fathoms (7^{m}3), mud, about three-quarters of a cable eastward of the head of the pier, when she can be breasted alongside. Or the vessel can anchor, in a depth of 3½ fathoms (6^{m}4), mud, with High point (*Lat. 14° 19′ N., Long. 122° 37′ E.*) in line with the western extremity of Calalanag island, bearing about 348°, and Samur island, about 16 miles north-eastward, showing midway between the southern end of Palita island and the mainland, bearing about 052° ; small craft may anchor farther up the bight on the latter mark, but only if the reefs are visible, and it will be necessary to moor head and stern.

Coast. — Danger. — Buoy. — Beacons. — Between the eastern entrance point of Dahikan bay and the point forming the western side of Port Jose Panganiban are two inlets filled with mud and rocks. Calambayanga island, 230 feet (70^{m}1) high, and wooded, lies about 4 cables north-westward of the western entrance point of Port Jose Panganiban, to which it is connected by a causeway on a reef which dries. There is a pier at the north-western extremity of Calambayanga island ; in 1949, it was reported that there was a depth of 25 feet (7^{m}6) alongside the western face.

A shoal, with a depth of one fathom (1^{m}8) over it, lies about 3½ cables north-north-westward of the north-western extremity of Calambayanga island, and is marked by a can buoy.

Port Jose Panganiban. — Beacons. — Port Jose Panganiban is entered between the northern end of Calambayanga island and Pinandungan point, about 2 miles north-eastward, and extends about 3½ miles south-eastward ; the depths decrease gradually from 10 fathoms (18^{m}3) in the entrance to less than one fathom (1^{m}8) off the town of Jose Panganiban (Mambulao) at the head of the port.

Two leading beacons, in line bearing 144°, are situated at the head of Port Jose Panganiban, and a beacon for use when turning into the channel, stands on Calambayanga island.

The port is clear of dangers, easy of access and affords good anchorage over a bottom of soft sand for vessels with local knowledge. Considerable swell sets in with strong north-westerly winds, and it cannot be recommended as a typhoon shelter.

There is a pier, which had, in 1949, a depth of 25 feet (7^{m}6) alongside its western face, situated on the north-eastern side of the port, about 1½ miles southward of Pinandungan point.

Port Jose Panganiban is a port of entry to foreign shipping.

Pinandungan point is bluff, wooded, and fringed by a steep-to, coral reef, which extends about one cable offshore. Mangrove point,

Charts 943, 1263.

about 1¼ miles eastward of Pinandungan point, is low, covered with mangroves, and fringed by a reef which extends a quarter of a mile offshore.

Directions.—A vessel should enter with the leading lights in line, and when the beacon on Calambayanga island bears 248°, she should steer 090°, taking care not to get southward of this line of bearing as the depths decrease rapidly.

Tanao pass. — Lights. — Dangers. — Tanao pass, situated between the coast of Luzon on the south and Tanao islands and Maculabo (Makulabo) island on the north, has a least width of 3¾ miles between Mangrove point and Tanao island, and 2¾ miles between the shoals on either side.

Tanao islands are a group of three islands and several large rocks, lying about 4 miles northward of Pinandungan point. Palumbato, the western island, is 49 feet (14^{m}9) high, bare, and very flat on top. Tailon, the largest of the group, is 15 feet (4^{m}6) high, covered with bushes, and is bordered by a white sandy beach. A ridge, with a least depth of 3 fathoms (5^{m}5) in the middle, over which the sea breaks in a northerly swell, extends between Palumbato and Tailon islands.

A light is exhibited, at an elevation of 60 feet (18^{m}3), from a white concrete pillar, on the southern extremity of Tailon island (*Lat. 14° 25′ N., Long. 122° 40′ E.*).

Tanao island, 57 feet (17^{m}4) high, and wooded, lies 4 cables south-eastward of Tailon island, and is the most prominent of the group. Two black rocks, 32 feet (9^{m}8) high, lie within 2 cables northward of Tanao island. These rocks, with Tanao and Tailon islands all lie on the same reef which dries. The southern side of Tanao island is fringed with a narrow reef, which is steep-to.

A shoal, with a least depth of 2 feet (0^{m}6) over it, lies about 1½ miles south-eastward of Tanao island.

Maculabo island, 814 feet (248^{m}1) high, and steep-to except for a narrow fringe of coral which dries on its western side, lies about 7½ miles eastward of Tanao island. There are several shoals, with depths of from 3¾ to 6 fathoms (6^{m}9 to 11^{m}0) over them, between the two islands, with deep channels between them.

Medio reef, with a least depth of 3 fathoms (5^{m}5) over it, lies in the middle of the eastern end of Tanao pass, about 3 miles west-south-westward of the southern extremity of Maculabo island. The channel southward of the reef is recommended. A 6½-fathom (11^{m}9) patch lies about 1½ miles southward of the southern point of Maculabo island, and a 5½-fathom (10^{m}1) patch about 1¾ miles south-eastward of the same point. A 6½-fathom (11^{m}9) patch lies about 2 miles south-eastward of the northern point of the island, and a 6-fathom (11^{m}0) patch 2¼ miles north-westward of the same point.

Between Mangrove point and Bacacay (Bakakay) point, about 11½ miles east-south-eastward, the land is heavily wooded, with several prominent hills; the coast is fringed by a narrow, steep-to coral reef, and indented by several bays; thence to the mouth of Daet river, about 13 miles south-eastward, the coast is low and sandy.

Gumaus bay, entered between a point about 1½ miles eastward of Mangrove point and Gumaus point, 2 miles farther eastward, is clear of dangers except for a shoal, with a depth of 2 fathoms (3^{m}7) over it, lying in the entrance about 6 cables west-north-westward of Gumaus point. The shores of the bay are fringed by a reef which extends about 2½ cables north-westward from Gumaus point.

About 2½ miles east-south-eastward of Gumaus point is Pulandaga point, 50 feet ($15^{m}2$) high, well wooded, and fringed by a coral reef which extends about a quarter of a mile north-westward. On the western side of this point is Pulandaga bay, the shores of which are fringed by coral. Anchorage may be obtained by small vessels with local knowledge, partially protected during the North-east monsoon by the reef extending from Pulandaga point, towards the head of the bay, in a depth of 5 fathoms ($9^{m}1$).

Paracale (Parakale) reef, with a depth of 4 fathoms ($7^{m}3$) over it, lies nearly 2 miles east-north-eastward of Pulandaga point, and a reef, with a depth of 4½ fathoms ($8^{m}2$) over it, lies 3¼ miles eastward of the same point, and about 1½ miles offshore.

Between Pulandaga point and Tanoban point, 3¾ miles east-south-eastward, there is a bay which is divided into two smaller bays, named Paracale and Malaguit, separated by Longos point, a wooded promontory, 200 feet ($61^{m}0$) high. The town of Paracale (Parakale) and the village of Malaguit are situated near the mouths of the rivers of the same names, respectively, which discharge into the head of the two bays. Both rivers have shallow entrances. Good anchorage, protected during the South-west monsoon, may be obtained by small vessels with local knowledge in either bay, but they, as well as Gumaus and Pulandaga bays, are frequently untenable during the North-east monsoon.

A light is exhibited, at an elevation of 35 feet ($10^{m}7$), from a white concrete tower, on the beach at Paracale (*Lat. 14° 17′ N., Long. 122° 47′ E.*).

Tanoban point, which rises to an elevation of 280 feet ($85^{m}3$) 7 cables within, is fringed by a reef which dries, and a spit, with a depth of 1½ fathoms ($2^{m}7$) at its outer end, extends about half a mile eastward from it. Bacacay point rises to a wooded hill, 370 feet ($112^{m}8$) high, with a prominent bare patch, about half a mile within. It is fringed by a narrow, steep-to coral reef. A shoal, with a depth of 2½ fathoms ($4^{m}6$) over it, lies about one mile eastward of Bacacay point.

Directions for Tanao pass.—From a position 3 miles northward of Jesus point, a vessel should steer for the southern point of Maculabo island, bearing 093°, until Palumbato island bears 010°, when she should steer to pass midway between Gumaus point and Medio reef; when the western extremity of Maculabo island is in line with the western extremity of Samur island (page 525), bearing 020°, she should steer about 094°, with Mangrove point astern, which will lead about one mile northward of Paracale reef.

Off-lying islands and dangers.—Calagua (Kalagwa) islands are a group of six islands and a number of islets and rocks lying in the eastern approach to Lamon bay. The principal islands from west to east are Maculabo (described on page 523), Samur, Tinaga, Guintinua, Ingalan, and Huag islands. Most of the group are bold and less than 500 feet ($152^{m}4$) high, except Maculabo. The two largest of the group, Guintinua and Tinaga, 498 and 394 feet ($151^{m}8$ and $120^{m}1$) high, respectively, are joined to each other and to Huag island, 318 feet ($96^{m}9$) high, and several of the islets by coral reefs which dry. There

Chart 3806.

are deep channels between this group of connected islands and the other islands of the group.

Samur island, 306 feet ($93^{m}3$) high, round-topped and prominent, lies about 3½ miles north-north-eastward of Maculabo island. A 4¾-fathom ($8^{m}7$) patch lies 1¾ miles westward of Samur, and a 6½-fathom ($11^{m}9$) patch, 2 miles farther westward.

Thurston rock, 10 feet ($3^{m}0$) high, lies 4¼ miles north-north-westward of Samur island. A reef of rocks, some of which are awash, lies within 1½ miles eastward of Thurston rock. In the area eastward of these rocks and northward of Samur, the depths are very irregular, the least depth being 6 fathoms ($11^{m}0$).

Lima rock, with a depth of about 4 feet ($1^{m}2$) over it and steep-to, lies 4 miles northward of Thurston rock.

Twin rocks, 10 and 15 feet ($3^{m}0$ and $4^{m}6$) high, lie nearly one mile south-eastward of Samur island, and between them and Tinaga island are several shoals with depths of from 6 to 8 fathoms ($11^{m}0$ to $14^{m}6$) over them.

Good protected anchorage during strong north-easterly winds may be obtained by vessels with local knowledge south-south-westward of the village of Banacboc, situated 1½ miles westward of the south-eastern extremity of Guintinua island, with the south tangent of the island bearing 093°, and the western extremity of Ingalan island, 181°. Small vessels may anchor closer in, but they should proceed cautiously, as the coastal reef is steep-to.

Ingalan island (*Lat. 14° 22′ N., Long. 122° 57′ E.*), the southernmost of the group, is 259 feet ($78^{m}9$) high and steep-to on all sides.

Charts 3806, 3808.

Amalia islet, 92 feet ($28^{m}0$) high, and Paquita islet, 120 feet ($36^{m}6$) high, lie about 4¼ and 5¼ miles, respectively, eastward of Ingalan island. Both islets are steep-to and clear of dangers.

Roses reef, consisting of two rocks, with depths of about one foot and 4 feet ($0^{m}3$ and $1^{m}2$), respectively, over them, lie within one mile westward of Amalia islet.

Matandumaten rock is a bare, perpendicular rock, 145 feet ($44^{m}2$) high, lying 5 miles east-south-eastward of Paquita islet. Close to this rock are some others, from 40 to 50 feet ($12^{m}2$ to $15^{m}2$) high, and south-westward of it are some rocks awash. The group may be safely passed at a distance of half a mile.

Chart 3806.

Coast.—Between Bacacay point (page 523) and Indan point, 4¾ miles south-eastward, there is a bight with sandy shores, which are wooded nearly to the water's edge. Indan river, which is very shallow, discharges on the western side of Indan point. Foul ground extends about one mile northward and east-south-eastward from the point. Vessels should give the point a wide berth.

Quinamanuca (Kinamanuka) island, 1¾ miles south-eastward of Indan point, and three-quarters of a mile offshore, is 12 feet ($3^{m}7$) high, densely wooded, and shows up well against the low land between the coast and Mount Bacacay (Bakakay), 2,579 feet ($786^{m}1$) high, 5¾ miles westward of Indan point. It is fringed on the eastern side by a coral reef, beyond which shallow water extends half a mile south-eastward. There is a least depth of 2 fathoms ($3^{m}7$) in the fairway of the channel between Quinamanuca island and the coast of Luzon.

Charts 943, 1263.

Chart 3806.

Between Indan point and the entrance to Daet river, about 8½ miles south-eastward, the coastal bank, with depths of less than 5 fathoms (9^{m}1) over it, extends about 1½ miles offshore in places. A 7-fathom (12^{m}8) patch lies about 1¼ miles south-eastward of Quinamanuca island and 1¾ miles offshore. Two patches, with depths of 8 and 6¼ fathoms (14^{m}6 and 11^{m}4) over them, lie about 2¾ miles north-eastward and 3½ miles east-north-eastward, respectively, of Grove point, situated about 5½ miles south-eastward of Indan point. The south-western extremity of Canimo island (*see* below) in line with the north-eastern extremity of Caringo island, bearing 141°, leads clear of all dangers along this part of the coast.

Charts 3806, 3808.

Mercedes.—Mercedes, the port of Daet, which is situated about 3½ miles up the river of the same name, stands on the western side of the entrance to Daet river; it consists principally of warehouses and a number of native houses. The harbour is formed by the banks of the river, and a reef, which dries, which extends across the mouth, about 4½ cables north-north-westward from Daet point (*Lat. 14° 07′ N., Long. 123° 01′ E.*), the eastern entrance point, affording protection from the sea. The harbour is not safe for vessels drawing more than 12 feet (3^{m}7), or over 180 feet (54^{m}9) in length.

Pilotage is compulsory for vessels over 50 tons gross. Pilots are always on the look-out and will go out if it is possible to cross the bar.

Anchorage may be obtained by vessels with local knowledge, in a depth of about 8 fathoms (14^{m}6), about three-quarters of a mile north-westward of Daet point. Vessels should approach the anchorage with Cone mountain, 1,400 feet (426^{m}7) high, situated 8½ miles south-south-westward of Daet point, bearing 200°. The town and mouth of the river are not visible from seaward.

A vessel entering the harbour should secure alongside the wharves with her head to seaward, as during the North-east monsoon the wind often reaches the force of a gale. The channel, which has a least depth of 8 feet (2^{m}4), is usually marked by stakes. The current in the river sometimes attains a rate of 7 knots.

There is regular steamer communication with Manila and the ports of eastern Luzon.

Off-lying islands.—Light.—Canimo (Kanimo) island, the north-western point of which lies 2¼ miles north-eastward of Daet point, is fringed by a narrow, steep-to coral reef. It is 606 feet (184^{m}7) high at its northern end, and the northern and eastern slopes are covered with tall grass to the summit, while the rest of the island is densely wooded. Good anchorage may be obtained by vessels with local knowledge, protected from all except northerly winds, westward of the island.

A light is exhibited, at an elevation of 138 feet (42^{m}1), from a white concrete tower, on the north-western extremity of Canimo island.

Canton (Kanton island) 355 feet (108^{m}2) high, lies nearly 2 miles south-eastward of Canimo island. There is a prominent tree on the summit of the island, and the south-eastern extremity is a well defined, thinly-wooded bluff, which is a good landmark for vessels approaching San Miguel bay. Apuao and Apuao Grande islets, the latter 380 feet (115^{m}8) high, and several rocks above water lie between Canimo and Canton islands. Canton island and the islets and rocks just mentioned lie on a reef, which partly dries, leaving a narrow channel between a

Charts 943, 1263.

Charts 3806, 3808.

black rocky islet lying on the western edge of this reef and Canimo island.

Quinapagyan island, 10 feet ($3^{m}0$) high and densely wooded, lies one mile eastward of Pambuan point, situated about 3 miles south-south-eastward of Daet point (*Lat. 14° 07′ N., Long. 123° 01′ E.*). Sand point, the western extremity of the island, is a steep-to, prominent sandy point.

Caringo (Karingo island), 1¾ miles south-eastward of Quinapagyan island, is mostly low and well wooded, but on its southern side there is a bluff, about 40 feet ($12^{m}2$) high. Its north-eastern and eastern sides are fringed by a coral reef, parts of which dry for as much as 7 cables offshore.

Malasugue islet, lying on a reef about midway between Quinapagyan and Caringo islands, is low.

The area bounded by Apuao islets, Canton, Quinapagyan, and Caringo islands is foul and should not be entered by vessels without local knowledge.

Canimo pass.—Canimo pass, the western channel into San Miguel bay, lies between Luzon on the west and Canimo and Quinapagyan islands on the east, and is the usual route taken by small coasting steamers between Daet and the head of San Miguel bay. Vessels without local knowledge are advised to take a pilot, who may be obtained at Daet. For vessels bound south there are no difficulties until nearing Quinapagyan island; here the channel is narrowed by reefs extending from the mainland and a large reef extending from the northern side of the island, on which there is a one-fathom ($1^{m}8$) patch lying three-quarters of a mile northward of Sand point.

The greatest danger in the pass is a rocky reef, awash, lying in mid-channel, about 3½ cables west-north-westward of Sand point; except at low water there is no indication of its presence.

A vessel from northward bound through Canimo pass should, from a position about 6 cables westward of Canimo island lighthouse, steer for Sand point, bearing 159°, which leads eastward of the reef, awash, lying in mid-channel, mentioned above; thence she should pass from one to 1½ cables westward of Sand point.

Culasi point (*see* below), bearing about 167°, open westward of Sand point, leads westward of some 8-foot ($2^{m}4$) patches on the eastern side of the fairway.

SAN MIGUEL BAY.—Dangers.—San Miguel bay is entered between Caringo island and Siruma island, about 5½ miles eastward. The navigable width of the entrance is contracted to 4 miles by Bicol (Bikol) rock, which dries about 2 feet ($0^{m}4$), lying about 1¼ miles westward of Siruma island, and by the reef extending from the eastern side of Caringo island.

The western shore of San Miguel bay between Culasi (Kolasi) point, about 5½ miles south-south-eastward of Pambuan point, and Magsatangi point, about 5½ miles farther southward, is densely wooded and mountainous; it is steep-to except for a reef which extends about half a mile north-eastward from Culasi point. There is a pier at Angas, situated close south-westward of Pambuan point. The village of Culasi (Kolasi) stands on a bluff about 2 miles northward of Magsatangi point; it is small and not readily seen from seaward. Culasi (Kolasi)

Charts 943, 1263.

Charts 3806, 3808.

peak is a sharp conical mountain, 1,275 feet ($388^{m}7$) high, lying about half a mile north-westward of Magsatangi point; this peak is only about half the elevation of the other peaks in the vicinity, but it is notably isolated from the rest of the high land and may be readily identified from all directions except from south-eastward.

Siruma island, about 50 feet ($15^{m}2$) high, and wooded, is fringed by a reef, which extends about three-quarters of a mile westward. The eastern end of the island is connected by reefs with Siruma point. A rock above water lies on the fringing reef about 1½ cables northward of the northern extremity of the island.

Two shoals, with depths of 2½ and 3 fathoms ($4^{m}6$ and $5^{m}5$) over them, lie on the eastern side of the fairway about 1¼ miles north-westward and 1¾ miles north-north-westward, respectively, of the western extremity of Siruma island. A 7-fathom ($12^{m}8$) patch lies 2¾ miles south-eastward of Caringo island.

The eastern shore of the bay between San Miguel island and the entrance to Looc river, 4¼ miles south-eastward, is indented by several bights which are shallow and have rocky points. The bottom off this shore is hard sand with rocks close offshore to depths of 3 and 4 fathoms ($5^{m}5$ and $7^{m}3$), outside which there is soft mud.

Siruma bay, entered between Siruma point and Quelun point, about 1¼ miles southward, is encumbered with rocks, above and below water, over the greater part, and depths of less than one fathom ($1^{m}8$) extend one mile from the head. A rocky patch, with a depth of 1¼ fathoms ($2^{m}3$) over it, lies in the western approach to the bay, 6½ cables southward of the western extremity of Siruma island. A rocky islet, with a few bushes on it, lies about three-quarters of a mile westward of Quelun point, and sunken rocks extend about 3½ cables westward from the islet. This vicinity should be avoided. The town of Siruma is situated on the southern shore of the bay.

San Miguel island (*Lat. 13° 58′ N., Long. 123° 14′ E.*), low and well wooded, lies about 2 miles southward of Quelun point. Its sides are rocky and at its south-eastern end is connected to the mainland by a sand bar which dries. Some detached rocks lie close off the north-western end of the island.

Looc (Look) river, entered about 4¼ miles south-eastward of Miguel island, is about 1½ miles wide at its entrance; it is the outlet of a large tidal lagoon, the shores of which are low and mostly fringed with mangrove. There is a small islet in the middle of the lagoon. As the channel into the river is intricate and the tidal streams run at a considerable rate, only vessels with local knowledge should attempt to enter. Balocbaloc (Balokbalok) point, the southern entrance point of the river, is low and sandy, and from it a spit, which dries, extends half a mile northward.

Chart 3808.

Kagliliog point, about three-quarters of a mile southward of Balocbaloc point, is rocky, and there is a detached rock about half a cable westward of it. The bottom is rocky for some distance off, and this rock should not be approached within half a mile.

Between Balocbaloc point and the entrance to Caaluhan (Kalwan) river, 6½ miles south-south-eastward, the shore is rocky for the first 3 miles and the bottom offshore changes from mud to sand between depths of 3 and 4 fathoms ($5^{m}5$ and $7^{m}3$); for the remaining distance

Chart 3808.

the shore is low and the mud bottom extends to the muddy or sandy beach. The village of Tinambac (Tinambak), situated about one mile northward of the northern entrance point of Caaluhan river, contains a church with a white cross, which is a good mark in a favourable light.

Projecting from the southern side of Magsatangi point is a hook of land nearly one mile in length, enclosing a bight, which dries at extreme low water. The prominent part of this hook is Tacubtacuban hill, round-topped and 340 feet ($103^{m}6$) high; the neck connecting this with the mainland and with the curved hook projecting westward from its southern side consists of low, narrow sand spits covered with mangroves.

Thence the shore of the bay to the entrance of Manga river, about 6½ miles southward, is mostly rocky, though broken by several sand patches and wooded to the water's edge.

Head of San Miguel bay.—Light.—Buoy.—Between the entrance to Manga river and the mouth of Bicol (Bikol) river, about 5 miles south-eastward, there are sandy beaches. The village of Barceloneta (*Lat. 13° 46′ N., Long. 123° 03′ E.*) stands at the foot of a fairly prominent grassy bluff showing patches of red soil in places, close southward of the mouth of Manga river. The land in this vicinity is low and flat.

Bicol river is navigable for vessels with local knowledge as far as Naga, an important town, 20 miles up the river. The least depth in the approach channel and on the bar is about 9 feet ($2^{m}7$) at high water. In the former the bottom is soft mud, and at the latter, sand.

A light is exhibited, at an elevation of 34 feet ($10^{m}4$), from a white steel framework tower, on the western entrance point of Bicol river, and about three-quarters of a mile northward of the village of Cabusao (Kabusao).

A black can buoy, moored 1¾ miles offshore and about 2¼ miles north-north-westward of the light-structure, marks the anchorage for vessels waiting to enter Bicol river.

Pilots are always in attendance at the village of Cabusao. Pilotage is compulsory for vessels over 50 tons gross as the channel over the bar is unmarked.

From the entrance to Bicol river to Tanglar point, 7 miles eastward, the shore is low, flat, and muddy, and landing is impossible except at high water. Tanglar island, close north-eastward of Tanglar point, is bold, covered with trees, and rocks lie along its northern coast. An islet lies 6 cables eastward of Tanglar island and about 1½ cables offshore.

Cagsao (Kagsao) and Bogui points are the principal breaks in a muddy or sandy beach, lying about midway between Tanglar point and the mouth of Caaluhan river, about 6 miles north-eastward. Southward of this stretch of the shore rise the foothills of Mount Isarog, covered partly with trees and partly with grass. Mount Isarog, an extinct volcano, 9 miles south-eastward of Cagsao point, rises to two peaks, 6,482 and 6,255 feet ($1{,}975^{m}7$ and $1{,}906^{m}6$) high, and is very prominent.

Cauit (Kauit) island, 145 feet ($44^{m}2$) high, lies 6 cables north-westward of Cagsao point; on its northern side there is a light-coloured bluff. Cabgan (Kabgan) island, about 1½ cables south-westward of Cauit island, is a round-topped cone, 170 feet ($51^{m}8$) high, with a large banyan tree on its summit. There is a warehouse on Cabgan island,

Charts 943, 1263.

Chart 3808.

and a larger one on the mainland opposite. The passage between Cauit island and Cagsao point has a depth of 6 feet (1^m8), and is clear of dangers.

About 3½ cables westward of Cauit island is a shoal of sand, with a group of rocks on it, which dry 6 feet (1^m8). Less than a quarter of a mile south-westward of these rocks is a sunken rock.

Anchorages.—Vessels with local knowledge may obtain anchorage, in depths of from 4 to 5 fathoms (7^m3 to 9^m1), mud, three-quarters of a mile southward of the south-eastern point of San Miguel island; the approach to the anchorage is clear of dangers and the depths decrease gradually; small vessels can anchor nearer the coast in a depth of 3 fathoms (5^m5), sand, about half a mile south-eastward of the same point, fairly sheltered from winds between north-west, through north, to south-east.

There is a small anchorage, in a depth of 3 fathoms (5^m5), sand, mud, and rocks, eastward of the northern end of the island, halfway between the point and the eastern shore of the bay. This anchorage should be approached with caution, as there are rocks, which dry, some distance off the eastern shore.

Anchorage may be obtained by vessels with local knowledge off Angas, with the pier bearing 289°.

Anchorage may be obtained by small vessels with local knowledge, in a depth of 3 fathoms (5^m5), mud, sheltered from strong north-westerly winds, half a mile southward of the western extremity of the hook of land south-westward of Tacubtacuban hill (*Lat. 13° 54′ N., Long. 123° 05′ E.*), or a little farther out, in a depth of 4 fathoms (7^m3).

The space between Cagsao point and Cauit and Cabgan islands has a bottom of soft mud, and affords the only safe anchorage in the bay for vessels of less than 6 feet (1^m8) draught. The best anchorage is between Cauit island and Cagsao with the drying rocks awash showing midway between Cauit and Cabgan islands.

Charts 3806, 3808.

COAST.—Sapenitan bay, entered between Siruma point and Sapenitan point, 3½ miles north-north-eastward, affords good anchorage for vessels with local knowledge, sheltered from all winds, except those between north and north-west, in depths of from 4 to 6 fathoms (7^m3 to 11^m0), mud, about one mile offshore, between the mouths of two rivers which discharge into the head of the bay.

A shoal, with a depth of 3¾ fathoms (6^m9) over it, lies on the southern side of the entrance, about one mile northward of Siruma point, and a 3-fathom (5^m5) patch lies about 1¼ miles north-eastward of the same point, and about half a mile from the southern shore. Sapenitan point is low and wooded, at its extremity, but the land within rises to an elevation of 350 feet (106^m7) about 2¼ miles south-eastward. It is fringed by a reef, which partly dries, extending nearly one mile north-westward and northward.

Between Sapenitan point and Quinabucasan (Kinabukasan) point, 5¼ miles east-north-eastward, the coast is indented by Butauanan bay, the western arm of which extends 2 miles south-eastward. The shores of this arm are fringed with coral reefs, leaving a clear space between them, about half a mile wide, with depths of from 5 to 8 fathoms (9^m1

Charts 3806, 3808.

to $14^{m}6$). At Tandoc, on the western shore of this arm, there is a sawmill and a pier, 300 feet ($91^{m}4$) long, with a depth of 27 feet ($8^{m}2$) alongside, in 1950, and there are four black pile beacons for the assistance of vessels proceeding alongside. There is a travelling crane, with a lifting capacity of 10 tons, on the pier. A shoal, with a least depth of 10 feet ($3^{m}0$) over it, lies about 6 cables south-eastward of the head of the pier.

The eastern arm is encumbered with reefs, on which there are several small islets; the outer one, 50 feet ($15^{m}2$) high, lies on the edge of the reef between the entrance points, and marks the south-eastern side of the channel between Quinabucasan point and Batauanan island. A rocky shoal, with a depth of 3¾ fathoms ($6^{m}9$) over it, lies about half a mile west-north-westward of the point separating the two arms.

Butauanan island, separated from Quinabucasan point by a channel, with a least width of 1¼ cables, and a least depth of 6 fathoms in the fairway, is well wooded, and 763 feet ($232^{m}6$) high in the northern part. The northern coast of the island is clear of off-lying dangers and may be safely passed at a distance of half a mile. The western side is fringed by a coral reef, which, at its southern end, extends about 6 cables westward, and a bank, with a rock awash on it, extends about 6 cables farther westward.

Good anchorage may be obtained by vessels with local knowledge during strong north-easterly winds, in a depth of 12 fathoms ($21^{m}9$), about half a mile from the western side of Butauanan island, with the southern extremity of that island bearing 130°, and the north-western extremity, 334°. Anchorage may also be obtained about three-quarters of a mile south-south-westward of the southern extremity of Butauanan island, in a depth of 9 fathoms ($16^{m}5$), mud, with the 50-foot ($15^{m}2$) islet, previously mentioned, bearing 070° and the north-western point of Butauanan island, 335°. The approach to the latter anchorage from north-westward lies between the reef extending westward from the southern end of Butauanan island and the 3¾-fathom ($6^{m}9$) rocky shoal half a mile southward of it.

Chart 3808.

Between Quinabucasan point and Caramoan point, about 40 miles south-eastward, the coast is very indented and is fronted by numerous islands, between which and the coast are several well-protected anchorages for vessels with local knowledge. The land rises steeply from the coast and is in most parts densely wooded. There are no towns of any importance on this coast.

Charts 3806, 3808.

San Vicente bay, entered between Dagdagen point (*Lat. 14° 02′ N., Long. 123° 22′ E.*), about 4½ miles south-south-eastward of Quinabucasan point, and a point about three-quarters of a mile east-south-eastward of the former, is encumbered with reefs, and the only available anchorage is in the entrance, southward of the western entrance point, in depths of from 9 to 12 fathoms ($16^{m}5$ to $21^{m}9$). A 6½-fathom ($11^{m}9$) patch lies about 1¼ miles northward of Dagdagen point.

A rock awash lies about half a mile north-eastward of the eastern entrance point of San Vicente bay. The coast between this point and the entrance to Port Tambang, 3¼ miles south-south-eastward, is fringed by a reef, which dries in places and on which are some islets, and extends as much as 3 cables offshore.

Charts 943, 1263.

Chart 3808.

Port Tambang, about 2 miles wide at its entrance, is encumbered with reefs and shoals, and is of no value to shipping.

A rock awash lies about 6 cables eastward of the north-western entrance point, with shallow water between. An islet, 198 feet ($60^{m}3$) high, lies close westward of Tambang point, the south-eastern entrance point.

A shoal, with a depth of 4¾ fathoms ($8^{m}7$) near its outer end, and a rock, awash, on it, half a mile offshore, extends about 1¼ miles northward from the coast close eastward of Tambang point.

Chart 3475, plan of Lamit bay.

Lamit bay.—Lamit bay, the best typhoon harbour on the east coast of Luzon, lies with the southern entrance point of the western entrance 3½ miles south-eastward of Tambang point. The bay is formed by a group of islands on the west, of which Paniqui islands, situated about 3½ miles northward of the southern entrance point, are the northernmost, Lamit islands on the east, and a bight in the coast southward.

Chart 3808.

Off-lying islands and danger.—Cimarron islands are a group of four islands lying in the northern approach to Lamit bay, about 2¾ miles north-north-westward of the Paniqui islands. The central and largest island is 160 feet ($48^{m}8$) high, and appears conical from eastward or westward, but from northward or southward it shows as a short ridge.

Aguda rock is a small rocky ledge, with a least depth of 2 fathoms ($3^{m}7$) over it, and steep-to, lying about 1½ miles northward of Paniqui islands. Except under the most favourable conditions it cannot be distinguished by the colour of the water, and it breaks only in heavy weather.

Chart 3475, plan of Lamit bay.

Paniqui islands (*Lat. 14° 00′ N., Long. 123° 31′ E.*) are three islands lying close together on the same reef, which can be safely passed at a distance of a quarter of a mile. The largest island of the group is 202 feet ($61^{m}6$) high.

Northern entrance to Lamit bay.—The northern entrance lies between Salobot islet, about 1¼ miles east-south-eastward of Paniqui islands, and the north-western end of the Lamit islands, about one mile farther in the same direction. Salobot islet is 90 feet ($27^{m}4$) high, and a reef, with a rock awash at its outer end, extends about a quarter of a mile eastward from it; a reef extends about one cable from the north-western extremity of Lamit islands, contracting the entrance, in which there are considerable depths, to a width of about 6¼ cables.

Sibauan island, 165 feet ($50^{m}3$) high, and wooded, lies 7 cables south-westward of Salobot islet. The island is fringed by a reef, which, on its northern side, extends about half a mile. Dinug islet, 100 feet ($30^{m}5$) high, and Naglaous islet, 95 feet ($29^{m}0$) high, lie on the outer edge of this reef, northward and north-eastward, respectively, of Sibauan island. On the eastern side of the island the fringing reef is narrow, and from the western side it extends from one to 4 cables offshore. Sampotan islet, 30 feet ($9^{m}1$) high, lies on this reef 4 cables south-westward of the northern extremity of Sibauan island. Several shoals, with depths of from 9 to 24 feet ($2^{m}7$ to $7^{m}3$) over them, lie within 6½ cables of the western side of Sibauan island.

Lamit islands are two densely wooded islands, separated by a very

Charts 943, 1263.

Chart 3475, plan of Lamit bay.

narrow impassable channel. The northern island is 260 feet (79^{m}2) high, and the southern, 380 feet (115^{m}8). The northern side of the northern island has bold, rocky points at either end, sloping to low land half a mile from the north-western point. Pawican islet, 60 feet (18^{m}3) high, lies close north-westward of the northern extremity of the northern Lamit island and is connected to it by a reef. Puling islet, 50 feet (15^{m}2) high, lies on the edge of the reef which fringes the northern coast of the same island about midway between the northern point and Cugun point, the north-eastern extremity. Both of these islets are steep-to on their northern sides.

The area between the southern end of the Lamit islands and the coast of Luzon is shallow and leads into Quinalasag passage.

Western entrance to Lamit bay.—Dangers.—Buoys.—The western entrance to Lamit bay lies between the southern entrance point and the southern extremity of Pagbocavan island, 8½ cables north-north-eastward, but the navigable channel is contracted to a width of 4½ cables by reefs which extend from either side, with a least depth of 11 fathoms (20^{m}1) in the fairway.

A shoal, with a depth of 3 fathoms (5^{m}5) over it, lies on the southern side of the approach to the western entrance, about 1¼ miles north-westward of the southern entrance point, and 5¾ cables offshore.

A rocky shoal, with a least depth of 13 feet (4^{m}0) over it, lies on the northern side of the approach, about three-quarters of a mile north-westward of Pagbocavan island (*Lat. 13° 57′ N., Long. 123° 31′ E.*). A black can buoy is moored on the western side of this shoal.

A shoal, with a depth of 3½ fathoms (6^{m}4) at its outer end, and a rock awash 1¾ cables within the outer end, extends about 6 cables northward from the southern side of the entrance, and a reef, which dries, extends about 3 cables northward from the extremity of the southern entrance point. A red buoy is moored on the edge of the shoal about half a cable northward of this reef.

Pagbocavan island, the southern island of the group forming the western side of Lamit bay, is 240 feet (73^{m}2) high, and wooded. The southern end terminates in a large brown rock, and a shoal, with a depth of 9 feet (2^{m}7) at its outer end, extends about 1¼ cables westward from the southern end of the island. A black can buoy is moored on the southern side of this shoal.

Islands and dangers in Lamit bay.—Beacon.—Bani islands are two islands, nearly connected, lying three-quarters of a mile south-south-westward of the north-western extremity of the northern Lamit island, and between them and the western end of the channel between the two Lamit islands are Tagita islet, Sulapa islet, 20 feet (6^{m}1) high, and Tag islet, 180 feet (54^{m}9) high. A reef, which dries, extends as much as 3½ cables from the southern side of the eastern Bani island, and 2¼ cables from the northern side.

A rock, with a depth of 4 feet (1^{m}2) over it, lies three-quarters of a mile north-westward of Tagita islet. A shoal, with a depth of 8 feet (2^{m}4) over it, and marked by a pile beacon, lies about 4½ cables southward of the western extremity of the western Bani island, and a shoal, with a depth of one foot (0^{m}3) over it, lies about 6 cables south-westward of the southern extremity of the eastern Bani island. There are three rocks awash lying within 4 cables southward of the southern extremity of the western Bani island.

Charts 3808, 943, 1263.

Chart 3475, plan of Lamit bay.

Cagbinunga island, 235 feet (71^{m}6) high, lies a quarter of a mile north-north-eastward of Pagbocavan island, and is connected to it by a reef.

Anchor island (*Lat. 13° 57′ N., Long. 123° 32′ E.*), 194 feet (59^{m}1) high, lies about one mile southward of the western Bani island; it is fringed by a reef which extends about 3 cables northward, and dries about 5 feet (1^{m}5). Between Anchor island and Pagbocavan island there are two shoals, with depths of 2 fathoms and 4 feet (3^{m}7 and 1^{m}2) over them, situated 2½ cables north-westward and 5½ cables westward, respectively, of the south-western extremity of Anchor island. A shoal, with a depth of 3 feet (0^{m}9) over it, lies about half a mile south-eastward of the eastern extremity of Anchor island.

Anchorages.—Directions.—Anchorage may be obtained by vessels with local knowledge, in depths of from 4 to 8 fathoms (7^{m}3 to 14^{m}6), mud, southward and south-westward of Anchor island.

A vessel from eastward usually enters Lamit bay by the northern entrance. Pawican islet, the eastern entrance point, and the western extremity of the western Bani island, may be safely passed at a distance of a quarter of a mile. Thence the vessel should pass about a quarter of a mile eastward of Anchor island and thence to the anchorage southward of the island.

Should the weather be such that there is difficulty in identifying the northern entrance, the vessel should continue westward and make for the western entrance, passing a quarter of a mile northward of Paniqui islands, thence westward of the shoals off-lying Sibauan island, with the largest Cimarron island astern, bearing 001°; when the southern end of Pagbocavan island bears 125°, she should steer to pass a quarter of a mile south-westward of it, and thence to the anchorage south-westward of Anchor island.

Chart 3808.

Outlying banks.—Several banks, with depths of 10 and 11 fathoms (18^{m}3 and 20^{m}1) over them, lie about 30 miles northward of Cimarron islands. A 7¼-fathom (13^{m}2) patch and an 11-fathom (20^{m}1) patch lie about 27 miles north-north-eastward and 42 miles north-eastward, respectively, of the same islands. Several 13- and 14-fathom (23^{m}8 and 25^{m}6) patches lie between the 7¼-fathom (13^{m}2) patch and the coast.

Coast.—Quinalasag (Kinalasag) island is a densely wooded island, 790 feet (240^{m}8) high, lying with its northern extremity about 3½ miles eastward of Cugun point (page 533). The island attains a greater elevation than that of the surrounding country and is a prominent landmark. The northern side is indented by several bays, the largest of which, near the eastern end, is Masamat bay, which is a good typhoon shelter for small vessels with local knowledge.

Bagacay (Bagakay) island, over 200 feet (61^{m}0) high, lies 1½ cables northward of the northern extremity of Quinalasag island, to which it is connected by a reef. It is an excellent landmark from eastward or westward, as from those directions it shows as twin peaks of nearly equal elevation. A ledge of rocks, with a rock awash at its northern extremity, lies within 4 cables northward of Bagacay island, and a reef, on which there is an islet, extends nearly 6 cables north-westward from the western side of the island.

Binagasbasan bay, lying between the eastern side of the southern Lamit island and the western side of Quinalasag island, is open north-

Charts 943, 1263.

Chart 3808.

ward, and is of no value to shipping. Bacon islet, 80 feet ($24^{m}4$) high, lies in the middle of the entrance, 1¼ miles south-south-eastward of Cugun point, and Badi islet, 39 feet ($11^{m}9$) high, on the eastern side of the entrance. Malabungut island, 395 feet ($120^{m}4$) high, forms the head of the bay.

The narrow channels between Lamit and Malabungut islands and between the latter and Quinalasag island are shallow and should not be used.

Quinalasag passage, southward of Lamit, Malabungut, and Quinalasag islands, connects Lamit and Sisiran bays. It is too shallow and encumbered by reefs for any but small boats.

Off-lying dangers.—A rock, on which the sea breaks, with a depth of less than 6 feet ($1^{m}8$) over it, was reported, in 1928, to lie about 2 miles north-north-eastward of Cugun point.

Hervor rock (*Lat. 14° 01′ N., Long. 123° 37′ E.*), awash, lies about 2½ miles north-eastward of Cugun point; it is steep-to, and the sea breaks continuously on it with a light swell.

Coast.—Sisiran bay, entered between the eastern extremity of Quinalasag island and Tinajuagan point, about 1½ miles eastward, affords good sheltered anchorage, in depths of from 4 to 5 fathoms ($7^{m}3$ to $9^{m}1$), in a bight on the south-eastern side of Quinalasag island, and also in a depth of 7 fathoms ($12^{m}8$), south-westward of Tinajuagan point.

Off-lying islets and dangers.—Laja islet, 20 feet ($6^{m}1$) high, is a dark bare rock, lying 1¼ miles northward of Tinajuagan point. About midway between the islet and the drying reef which extends 3 cables northward from Tinajuagan point, is a shoal which breaks in heavy weather, with a least depth of 4¼ fathoms ($7^{m}8$) over it. The best channel into Sisiran bay is westward of the islet.

Molar rock, 20 feet ($6^{m}1$) high, lies 5½ miles north-eastward of Laja islet. About 3½ cables north-north-westward of Molar rock is a sunken rock, on which the sea breaks heavily in bad weather, and about a quarter of a mile south-eastward of Molar rock is a rock, 5 feet ($1^{m}5$) high. Masnou islet, 87 feet ($26^{m}5$) high, and covered with grass, lies about three-quarters of a mile south-south-eastward of Molar rock. Black islet, 30 feet ($9^{m}1$) high, and bare, lies about one mile south-eastward of Masnou islet. The channel between them and that between Black islet and Sugar Loaf point are deep and clear of dangers in the fairway. The channel between Masnou and Black islets is the one generally used.

Tagun bay. — Light. — Dangers. — Tagun bay is entered between Tinajuagan point and Sugar Loaf point, the north-western extremity of Lahuy island, 6¾ miles east-north-eastward. The long tongue of land terminating in Tinajuagan point, which separates Sisiran and Tagun bays, is formed of broad ridges covered with grass, with narrow, steep, wooded valleys between them. Wide coral reefs fringe the western shore of the bay, and also encumber the head. On the eastern side of the bay navigation is less dangerous than on the western, as considerable depths can be carried closer up to the islands and projecting points.

Lahuy island is 614 feet ($187^{m}1$) high within half a mile of its southern extremity, and thence northward a ridge, about 500 feet ($152^{m}4$) high, extends to about the middle of the island; the northern half is com-

Charts 943, 1263.

Chart 3808.

posed of several peaks covered with grass and a few scattered trees. Sugar Loaf point is a remarkable round-topped, steep, wooded peak, 325 feet ($99^{m}1$) high. The northern coast is bordered by rocky cliffs and sandy beaches alternately, and there are some small rocks lying close off the north-eastern extremity. Several small islets and rocks lie off the northern and western sides of the island. Close northward of Sugar Loaf point are two rocks, 50 and 79 feet ($15^{m}2$ and $24^{m}1$) high, respectively.

Ocata (Okata) island (*Lat. 13° 59′ N., Long. 123° 49′ E.*), about half a mile north-eastward of Sugar Loaf point, is rocky on its northern side, and sandy on the southern side.

A light is exhibited, at an elevation of 125 feet ($38^{m}1$), from a white concrete pillar, on the summit of Ocata island. *See* view facing page 39.

A rock, with a depth of 3 feet ($0^{m}9$) over it, lies one cable westward of the southern part of Ocata island. About half a mile eastward of the island are three rocks, each about 3 feet ($0^{m}9$) high, and about a quarter of a mile south-eastward of the island is a rock, 7 feet ($2^{m}1$) high.

If desired, anchorage may be obtained off the rocky bluff point on the west coast of Lahuy island, about 2 miles southward of Sugar Loaf point. Two small channels lead from the head of Tagun bay through the islands between the southern end of Lahuy island and the coast southward, but they are too narrow and tortuous, in the absence of marks, to be of any practical value.

Eastern side of Lahuy island.—Dangers.—The eastern side of Lahuy island is fringed by a reef, which, near the northern end of the island, extends nearly 2 miles eastward with Basot and Cotivas islands lying close together on its outer edge. In the northern part of Basot is a grassy peak, 155 feet ($47^{m}2$) high, and in the southern part a flat-topped hill, 168 feet ($51^{m}2$) high; the coasts consist of sandy beaches and rocky cliffs. Basot island is covered with grass, while Cotivas island, lying close westward of its southern end, is wooded. Westward of Basot island, between the reef on which it lies and Lahuy island, a fairly good anchorage may be obtained by vessels with local knowledge, in a depth of about 8 fathoms ($14^{m}6$), in a bight known as Pocket bay, exposed to north-easterly winds.

A shoal, with a depth of 6 fathoms ($11^{m}0$) over it, lies about 4¾ miles eastward of the southern extremity of Lahuy island, and about midway between this shoal and the eastern side of the island is a shoal, with a least depth of 3¼ fathoms ($5^{m}9$) over it.

Coast.—The coast between Tinajuagan point and Yopoquit point, 11¾ miles south-eastward, is fringed by reefs, which dry in places, extending as much as 3 miles offshore, and is fronted by a number of islands and rocks. This coast forms part of the northern side of Caramoan (Karamoan) peninsula, which extends to Rungus point, 9¼ miles south-eastward of Yopoquit point. The peninsula is mountainous and well wooded.

Tabgon anchorage and approaches.—Tabgon village, north-eastward of which is Tabgon anchorage, stands at the foot of a prominent hill, 617 feet ($188^{m}1$) high, about 9 miles south-eastward of Tinajuagan point. This hill is covered with grass on its southern side and densely wooded on its northern side, and is the highest hill in the vicinity. There is steamer communication with other coastal ports.

Charts 943, 1263.

Chart 3808.

Tabgon anchorage is protected from north-eastward by Lucsuhin islands, but is exposed to northerly and north-westerly winds, and at times there is a choppy sea in the more exposed parts. There are depths of from 4 to 12 fathoms ($7^{m}3$ to $21^{m}9$), mud and sand, in the anchorage.

Lucsuhin (Luksuhin) islands are a group of islands and rocks lying on an extensive reef, parts of which dry, situated between Lahuy island and Caramoan peninsula. They are moderately high and covered with bushes, trees, and coconut palms. From seaward they appear as one, but at high water a boat can pass between them. Northward and south-westward of them are narrow and tortuous channels leading to Tagun bay (*see* page 535), which should only be used by vessels with local knowledge.

Solodon islet, the south-easternmost of Lucsuhin islands, is a large barren rock, 91 feet ($27^{m}7$) high, with a few bushes on its summit, lying about 1¾ miles northward of Yopoquit point ; it forms a useful landmark for entering Tabgon anchorage. About one mile eastward of Solodon islet is a shoal with a depth of 6 fathoms ($11^{m}0$) over it, on which the sea has been seen to break in heavy weather.

Haponan island (*Lat. 13° 50′ N., Long. 123° 51′ E.*), about 1¾ miles east-north-eastward of Tabgon village, is 202 feet ($61^{m}6$) high, covered with grass, bushes, and coconut palms. Its coast consists alternately of sandy beaches and low rocky points. Reefs extend half a mile north-eastward from it and form part of the southern side of the channel leading to Tabgon anchorage. The area between this island and the coast is foul.

Puling island lies 1¾ cables northward of the north-western extremity of Haponan island, with a deep channel, clear of dangers in the fairway, about one cable wide, between them. The island is 296 feet ($90^{m}2$) high, well wooded, except where it has been cleared on the northern part of the top, and is a good landmark. The channel between the two islands is seldom used, that northward of Puling island being considered preferable. A reef extends about 1½ cables from the northern side of Puling island. South islet, 28 feet ($8^{m}5$) high and covered with trees, lies on the outer edge of this reef.

North islet, 14 feet ($4^{m}3$) high, and covered with grass and small bushes, lies about 2½ cables northward of South islet. About 2 cables south-westward of North islet is the outer edge of a sunken detached reef, over which there is a least depth of 1½ fathoms ($2^{m}7$). The channel between these two islets leading to Tabgon anchorage is about 1¼ cables wide between the reefs on either side.

A sunken reef, over which there is a least depth of about 4 feet ($1^{m}2$), lies about 4 cables westward of the western side of Puling island.

Cocos island, situated on the reef extending from the mainland, and about 2 miles north-north-westward of Tabgon village, is 127 feet ($38^{m}7$) high and entirely covered with coconut palms. It is used as a leading mark for entering.

Anchorage may be obtained by vessels with local knowledge between Puling island and Haponan island, or south-westward of Puling island. During the North-east monsoon vessels may anchor close to the western side of Puling island, where there are greater depths than farther offshore.

Coast.—Yopoquit point is fringed by a reef which extends over

Charts 943, 1263.

Chart 3808.

half a mile offshore, and gradually narrows towards the coast about 2 miles south-eastward. The depths are very irregular off this stretch of coast, varying from 3½ to 21 fathoms (6m4 to 38m4), within a distance of about 3 miles offshore. The outermost shoal, with a depth of 5 fathoms (9m1) over it, lies about 3½ miles north-eastward of Yopoquit point. During the North-east monsoon the sea occasionally breaks on some of the shoaler patches, and this area should be navigated with caution.

Malarad islets are a group of islets and rocks, the highest of which has an elevation of 95 feet (29m0), lying within about one mile of the coast, about 1¾ miles south-eastward of Yopoquit point. They are partly wooded, and have steep rocky sides.

Between Yopoquit point and Malarad islets is Port Caramoan, the landing place during the South-west monsoon for the town of Caramoan (Karamoan), situated about 3½ miles southward of Yopoquit point. Paniman village stands at the head of Port Caramoan, about 1½ miles south-eastward of Yopoquit point.

Caramoan (Karamoan) point, the north-eastern extremity of Caramoan peninsula, is 425 feet (129m5) high, has steep rocky bluffs, about 50 feet (15m2) high, and is steep-to. The land within the point rises to numerous densely wooded peaks, from 600 to 1,000 feet (182m9 to 304m8) high, the highest of which, a round-topped peak, situated about 4 miles westward of the point, is a good landmark and may be easily identified.

Between Caramoan point (*Lat. 13° 48′ N., Long. 123° 56′ E.*) and Rungus point, the south-eastern point of Caramoan peninsula, the coast is very rugged and indented by a number of small bays with sandy beaches and rocky bluffs. Numerous islets and rocks lie within three quarters of a mile of the coast. The interior is hilly, rising to elevations of from about 300 to 700 feet (91m4 to 213m4) a short distance inland. There are no sheltered anchorages on this coast, except Pitogo bay, which is sometimes used as a harbour of refuge by small vessels with local knowledge.

Pitogo bay lies with its northern entrance point about three-quarters of a mile south-eastward of Caramoan point; in the middle of its entrance, which is one mile wide, is Pitogo island, 378 feet (115m2) high. The bay is backed by high wooded hills. There are two entrance channels, one on either side of Pitogo island. The northern channel is generally used, the southern one being encumbered with reefs.

Small vessels with local knowledge may obtain anchorage sheltered from north-easterly winds, south-eastward of Pitogo island but the swinging room is limited; also during typhoon weather in the bight in the northern side of the bay, which is about three-quarters of a cable wide at its entrance and extends 1½ cables northward; it is necessary to moor bow and stern in this bight.

Taebun channel.—Dangers.—Taebun channel, separating Catanaguan islands from Caramoan peninsula, has a least width of about 1½ miles, is deep in the fairway, and is frequently used by vessels with local knowledge.

A pinnacle rock, with a depth of 1½ fathoms (2m7) over it, lies on the south-western side of the fairway, about 4 cables north-eastward of Batobato point, situated about 2¾ miles south-eastward of Caramoan point; it is the outermost danger off this side of the channel.

Charts 943, 1263.

Chart 3808.

Catanaguan (Katanaguan) islands, two in number, lie about 2½ miles eastward of Caramoan point, with a deep narrow channel between the two islands. The northern island is 85 feet (25^{m}9) high, and covered with bushes and grass. About 2 cables northward of it is a rock, about 3 feet (0^{m}9) high, and about one cable eastward of the northern part of the island is a similar rock. A shoal, with a depth of 5½ fathoms (10^{m}1) over it, lies about half a mile westward of the northern point of the island.

The southern island, 102 feet (31^{m}1) high, is covered with trees and bushes; its coast consists of sandy beaches and rocky points. Close off the southern end of the island is a bare, pyramidal rock, 72 feet (21^{m}9) high, which shows up plainly from eastward or westward. A detached shoal, with a depth of 3 fathoms (5^{m}5) over it, and steep-to, lies about 3½ cables west-south-westward of the southern part of the island. The channel between this shoal and the pinnacle rock north-eastward of Batobato point (*Lat. 13° 45′ N., Long. 123° 58′ E.*) is about one mile wide.

Maqueda channel.—Maqueda channel, separating Luzon from the western side of Catanduanes island, is about 4¼ miles wide between Rungus point and Sialat point, the western extremity of Catanduanes island. In the northern part of the channel there are numerous dangerous rocks and shoals, which are described on page 517, the westernmost of which are the Dagat rocks, separated from Basot island (page 536) by a deep, clear channel, 6½ miles wide. An 8-fathom (14^{m}6) patch lies 4½ miles north-north-eastward of the northern extremity of the northern Catanaguan island.

The southern end of the channel is divided by Palompon islands, two in number, lying about 1½ miles eastward of Rungus point. The eastern island is 150 feet (45^{m}7) high.

Sombrero islet, 280 feet (85^{m}3) high, wooded, and conical, lies 1¼ miles north-north-eastward of Rungus point. It is a good landmark for vessels approaching Maqueda channel, as it is higher than the adjacent coast. About 3 and 5½ cables southward of Sombrero islet are Lato and Litao islets, respectively, 50 and 58 feet (15^{m}2 and 17^{m}7) high. The channel between Litao islet and Palompon islands is deep in the fairway and nearly one mile wide; there are tide-rips in this channel.

Westward of Sombrero islet, at the eastern end of Caramoan peninsula, is Lauing bay, encumbered with shoals. Rungus point is well wooded, the land within it rising to an elevation of 265 feet (80^{m}8).

CATANDUANES ISLAND.—Catanduanes (Katanduanes) island is traversed throughout its length by a chain of mountains, and is abundantly supplied with small streams.

The northern side is fringed with reefs; the western side is, in general, safe and steep-to; the southern side is fronted by a number of shoals and reefs; the eastern coast is rugged and indented by numerous small bays, and can be safely navigated by keeping one mile or 1½ miles from the headlands.

Northern side of Catanduanes island.—Yog point, the northern extremity of Catanduanes island, is about 150 feet (45^{m}7) high, and covered with grass and a few shrubs. Close northward of the point is a rocky islet, 144 feet (43^{m}9) high, on the northern part of which is

Charts 943, 1263.

Chart 3808.

Pin rock, about 120 feet (36^{m}6) high, which is a prominent mark from eastward or westward. This islet is steep-to and may be rounded at a distance of a quarter of a mile.

Pandan bay.—Light.—Pandan bay, entered between Yog point and Pandan point, about 4½ miles south-westward, is fringed by reefs which extend as much as half a mile offshore and on which are several islets. A small peninsula, on which there are two hills, about 70 feet (21^{m}3) high, extends northward from a position about 2½ miles south-westward of Yog point, dividing the bay into two parts. The north-eastern part is foul, and the south-western is used as the fine weather anchorage for Pandan.

A reef extends about 4 cables from the western side of the peninsula, and on the fringing reef in the western part of the bay are two islets, 60 and 50 feet (18^{m}3 and 15^{m}2) high, covered with coconut trees, situated about 6½ and 11½ cables, respectively, east-south-eastward of Pandan point. Between the eastern islet and the peninsula is a sandy beach intersected by two rivulets.

A shoal, with a depth of 5½ fathoms (10^{m}1) over it, lies nearly 1½ miles north-eastward of Pandan point, in the northern approach to the western part of the bay. Banks, with depths of from 7 to 9 fathoms (12^{m}8 to 16^{m}5) over them, lie within about half a mile north-north-westward and eastward of this shoal.

A light is exhibited, at an elevation of 35 feet (10^{m}7), from a white concrete beacon, on the shore in the western part of Pandan bay.

The town of Pandan (*Lat. 14° 03' N., Long. 124° 10' E.*) is situated about a quarter of a mile inland from the head of the western part of Pandan bay. It is nearly hidden by trees.

Anchorage.—Directions.—Anchorage may be obtained by vessels with local knowledge, in depths of 12 or 13 fathoms (21^{m}9 or 23^{m}8), with the eastern islet in the western part of Pandan bay bearing 205° and the northern extremity of the peninsula, 087°. Small craft may anchor south-south-eastward of this position, in a depth of about 9 fathoms (16^{m}5), clear of the fringing reefs.

A vessel from eastward should approach the anchorage with the eastern islet bearing 205°, and from westward should steer for the northern extremity of the peninsula, bearing 102°, until the eastern islet bears 205°, when she should steer for it on that bearing.

Pandan bay affords no protection during the North-east monsoon; at that season Cobo bay, about 2½ miles southward of Balangona point, the north-western extremity of Catanduanes island, affords sheltered anchorage for vessels with local knowledge wishing to communicate with Pandan.

Outlying bank.—Abriop bank, with a least depth of 15 fathoms (27^{m}4) over it, lies with its south-eastern extremity about 7½ miles north-north-westward of Yog point.

Western side of Catanduanes island.—Coast.—Balangona point is about 100 feet (30^{m}5) high, covered with grass, and is steep-to, with rocky bluffs. Between Balangona point and Sialat point, the western coast is bold and steep-to, and there are no ports of consequence. The small bay immediately southward of Balangona point is shallow at its head and does not afford anchorage, being restricted by the fringing reefs.

Cobo (Kobo) bay, about 2½ miles southward of Balangona point,

Charts 943, 1263.

Chart 3808.

affords anchorage to vessels with local knowledge, in a depth of 7½ fathoms (13^{m}7), sand, with the round wooded hill, 284 feet (86^{m}6) high, situated at the head of the bay, bearing 098°, and Toytoy point, the southern entrance point, 206°. Small craft may obtain more protection from the swell which sets in round Balangona point in heavy weather, in a break in the fringing reef, in depths of from 4 to 5 fathoms (7^{m}3 to 9^{m}1), sand. The village of Cobo stands at the head of the bay among the trees on the southern side of the 284-foot (86^{m}6) hill, but only a few houses are visible from seaward.

Toytoy point (*Lat. 14° 00′ N., Long. 124° 08′ E.*) is a prominent, partially wooded neck of land, 73 feet (22^{m}3) high, and rocky, with a rocky bluff, about 50 feet (15^{m}2) high. About 1½ cables south-south-eastward of the point are two rocks, the higher of which has an elevation of 18 feet (5^{m}5).

Off-lying islands and dangers.—Palumbanes islands are a group of three islands and several islets and rocks lying from 4 to 7 miles west-south-westward of Balangona point.

Porongpong, the central and largest of the group, is covered with high trees, and rises to an elevation of 436 feet (132^{m}9); there is a small village on its eastern side. Calabagio, the eastern island, is wooded, and 184 feet (56^{m}1) high. Fair anchorage, approached either from northward or southward, may be obtained by vessels with local knowledge, in a depth of 15 fathoms (27^{m}4), about a quarter of a mile westward of the southern end of Calabagio.

The western island of the group, lying about three-quarters of a mile from Porongpong, is 55 feet (16^{m}8) high and wooded. The channel between it and Porongpong has a least depth of 6¾ fathoms (12^{m}3).

About midway between Calabagio island and the coast of Catanduanes island, eastward of it, is an extensive shoal with a rock awash, at its northern end. About 1½ cables eastward of this rock the sea breaks over the shoal with a light swell. The channel between the shoal and Catanduanes island is about 1½ miles wide and has a least depth of 7 fathoms (12^{m}8) in the fairway.

Within 1½ miles northward and north-westward of Porongpong island and the western island of the Palumbanes islands, respectively, there are several shoals, with depths of from 1½ to 3¼ fathoms (2^{m}7 to 5^{m}9), the positions of which may best be seen on the chart.

Lane rocks, the northernmost dangers in the vicinity, are a group of four or five rocks, which dry about 5 feet (1^{m}5), lying about 5 miles north-north-westward of Porongpong island. They show up well and can be seen at all times. They are steep-to on all sides. A 2-fathom (3^{m}7) patch lies about half a mile northward of the rocks with a deep channel between.

Sail rock, 64 feet (19^{m}5) high, with a few bushes on it, lies about 1½ miles south-south-eastward of Porongpong island, and is a prominent mark. Several rocks, about 8 feet (2^{m}4) high, lie within one cable northward of Sail rock, and about half a mile south-south-westward is a 2-fathom (3^{m}7) patch. A rock, awash, lies about 3 miles south-south-westward of Sail rock. It can be distinguished at all times, but when the sea is smooth it is not very noticeable.

An extensive coral reef lies south-westward of Palumbanes islands, and near the north-western end are Dagat rocks, a group about 6 feet (1^{m}8) high, situated about 3 miles south-westward of the western island

Charts 943, 1263.

Chart 3808.

of the Palumbanes. About 3½ cables north-north-westward of these rocks is a 4-fathom ($7^{m}3$) patch. About 1¾ miles south-south-eastward of Dagat rocks is a small patch awash, which in calm weather cannot be seen from any distance. Over the remainder of the reef there are depths of from 4½ to 9 fathoms ($8^{m}2$ to $16^{m}5$).

Coast.—Light.—Caramoran (Karamoran) is a small town about 1¼ miles south-south-eastward of Toytoy point and about a quarter of a mile inland; it stands on a slight elevation at the foot of two hills; the stone church is a good mark. The sandy beach in front of the town is bordered by a coral reef which extends about 1½ cables offshore, and on which the sea breaks, making landing difficult, and at times impossible.

Between Toytoy point and Manamrag point, about 16 miles southward, there are no dangers lying outside a distance of a quarter of a mile of the coast; the greater part of the land within is hilly and densely wooded.

Port Manamrag is entered between Manamrag point, a rocky point, 100 feet ($30^{m}5$) high, and Borigay point, about three-quarters of a mile southward. It is shallow and rocky at the head, and a bank, with a depth of 2 fathoms ($3^{m}7$) at its outer end, extends about three-quarters of a cable southward from Manamrag point. Anchorage may be obtained by vessels with local knowledge, in a depth of 8 fathoms ($14^{m}6$), southward of Manamrag point. There is occasional steamer communication with other ports.

About 1¾ miles south-south-westward of Manamrag point (*Lat. 13° 44′ N., Long. 124° 06′ E.*), and about 3½ cables offshore there is a shoal, with a depth of 4 fathoms ($7^{m}3$) over it. Except for this shoal, the coast between Manamrag and Sialat points is steep-to and clear of dangers. Codon (Kodon) village stands at the head of a small bay on the southern side of Codon point, situated about one mile east-north-eastward of Sialat point; the bay is completely filled by a reef which dries.

Palompon islands, on the western side of Maqueda channel, have been described on page 539.

Sialat point is a high, bluff, rocky point with several rocks, which dry about 5 feet ($1^{m}5$), lying about 1½ cables south-westward of it. Except in this direction, the point is steep-to.

A light is exhibited, at an elevation of 355 feet ($108^{m}2$), from a white framework structure, on Sialat point.

Southern side of Catanduanes island.—Light.—Dangers.—About 1½ miles south-south-eastward of Sialat point and about 4 cables offshore is a rock, with a depth of 1½ fathoms ($2^{m}7$) over it. Between Bislig point, situated about 2 miles south-south-eastward of Sialat point, and Agoho point, about 2 miles farther southward, there is a bight encumbered with reefs which extend as much as 6 cables offshore. Agoho point is a mangrove swamp, fringed by a reef, which dries, extending about 2 cables offshore.

Calolbon (Kalolbon) is a small town, about 3 miles eastward of Agoho point.

A light is exhibited, at an elevation of 35 feet ($10^{m}7$), from a white concrete beacon, at Calolbon.

A shoal, with a depth of 1¾ fathoms ($3^{m}2$) over it, lies 8½ cables south-westward of the light-beacon at Calolbon.

Charts 943, 1263.

Chart 3808.

Anchorage may be obtained by vessels with local knowledge, protected from winds from west, through north, to east-south-east, in a depth of 10 fathoms (18^{m}3), about three-quarters of a mile offshore, with a group of warehouses at Calolbon bearing 036°, on which bearing vessels should approach.

A bank, with depths of from 3½ to 10 fathoms (6^{m}4 to 18^{m}3) over it, extends 1½ miles offshore from a position about three-quarters of a mile south-eastward of Cololbon. A rock, awash, lies about 6 cables offshore, about 2 miles south-eastward of the light-beacon at Cololbon. Thence to Virac (Virak) point, the southern extremity of Catanduanes island, the coast is mostly fringed by reefs extending not more than half a mile offshore.

Off-lying dangers.—Teresa bank, with a least depth of 1¾ fathoms (3^{m}2) over it, and steep-to, lies about 2¾ miles southward of Calolbon light-beacon and 1¾ miles offshore. Between this bank and the coast eastward of it are two shoals, with depths of 3¼ and 4 fathoms (5^{m}9 and 7^{m}3) over them.

Taguntun bank, with a least depth of 4¼ fathoms (7^{m}8) over it, lies 5½ miles westward of Virac point (*Lat. 13° 31′ N., Long. 124° 13′ E.*), and about 2½ miles offshore.

A bank, with a depth of 8 fathoms (14^{m}6) over it, lies 5¼ miles west-south-westward of Virac point, and 3½ miles offshore.

Pechili reef, with a least depth of 2½ fathoms (4^{m}6) over it, and on which the sea breaks in heavy weather, lies 2 miles south-westward of Virac point. About 6½ cables south-eastward of Pechili reef is a shoal, with a least depth of 6 fathoms (11^{m}0) over it. Vessels should avoid this locality.

Virac (Virak) bank, with a least depth of 6¼ fathoms (11^{m}4) over it, and over which the sea breaks heavily in bad weather, lies 4¼ miles south-eastward of Virac point.

Cabugao bay. — Light. — Dangers. — Cabugao (Kabugao) bay is entered between Virac point and Nagumbuaya point, 7¾ miles east-north-eastward. The shore is mostly a gravel and sandy beach, fringed in parts by coral reefs, which extend farthest offshore in front of the town of Virac (Virak), about 3½ miles northward of Virac point. Pajo river discharges into the western side of the bay, about 3 miles northward of Virac point, and Bato (Kabugao) river into the north-eastern part, about 4 miles eastward of the town of Virac. Cabugao (Kabugao) village stands on the western side of the entrance to Bato river, and the town of Bato on both sides of the same river, about three-quarters of a mile within the entrance.

The towns of Virac and Bato each contain a church, both of which are prominent; that at Virac has a white dome. Virac is the principal port in the island for the shipment of hemp.

A light is exhibited, at an elevation of 38 feet (11^{m}6), from a white concrete pillar, on the shore near the eastern end of the town of Virac (*Lat. 13° 35′ N., Long. 124° 14′ E.*).

Johns reef, over which there is a least depth of 5 feet (1^{m}5), and which breaks heavily, lies about 1½ miles east-north-eastward of Virac point. A rock, with a depth of 4½ fathoms (8^{m}2) over it, lies one mile eastward of the shoalest part of Johns reef. Several detached shoals, one of which is awash, extend about 1¼ miles offshore on the western side of the bay.

Charts 943, 1263.

Chart 3808.

A shoal, with a depth of 2 fathoms ($3^{m}7$) over it, lies about 1½ miles south-eastward of the light-structure at Virac. About 4½ cables north-north-eastward of it is a 4-foot ($1^{m}2$) patch, with a 2¾-fathom ($5^{m}0$) patch a quarter of a mile south-eastward of the latter. A shoal, with a depth of 5 feet ($1^{m}5$) over it, lies about 2¾ miles east-south-eastward of the light-structure at Virac, and 1½ miles from the northern shore.

Anchorages.—Directions.—The usual anchorage for vessels with local knowledge is in a depth of 8 or 9 fathoms ($14^{m}6$ or $16^{m}5$), about three-quarters of a mile south-eastward of the church at Virac.

Small craft can anchor about 1½ cables off the sand beach in front of the town in a small bight between the reef which extends about a quarter of a mile southward of Pandaman point, about 3 cables eastward of the northern end of the town and the fringing reef southward of the town. There is a concrete pier, with a depth of 23 feet ($7^{m}0$) at its head, at the head of this bight.

The usual anchorage for communicating with Bato is in a depth of 6 fathoms ($11^{m}0$), southward of Cabugao village.

Vessels intending to anchor off Virac should steer for Virac light-structure, bearing 344°, which leads westward of Virac bank, and between Johns reef and the rock, with a depth of 4½ fathoms ($8^{m}2$) over it, eastward of it, and thence to the anchorage.

Eastern side of Catanduanes island.—Coast.—From Yog point (page 539) to Bugao point, 7½ miles south-south-eastward, there are numerous cliffy projections, and the coast is fringed by a narrow, steep-to, coral reef. Two small coves, named Tabogoc and Minaili, both encumbered with reefs, lie about 3 and 4½ miles, respectively, south-south-eastward of Yog point. Tarahid point, 5 miles south-south-eastward of Yog point, is about 50 feet ($15^{m}2$) high, and rugged.

Purog bay, entered about half a mile southward of Tarahid point, is encumbered with reefs, but there are two narrow boat channels through them leading to the head of the bay. Minigil islet lies in the middle of the entrance to the bay, and is connected with the shore at the head by a reef, which is awash. The islet is one of the most rugged in the vicinity; on all sides, except the western, it is composed of cliffs rising almost vertically to an elevation of 140 feet ($42^{m}7$). The summit and the western slope are covered with grass and bushes. Minigil point, the southern entrance point of Purog bay, is high and rocky.

Between Minigil point and Bugao point (*Lat. 14° 00′ N., Long. 124° 17′ E.*) a reef, awash, extends one mile offshore, and a spit, with a depth of 2¾ fathoms ($5^{m}0$) at its outer end, extends half a mile from the reef eastward of Bugao point. Bugao point is low, sandy, and covered with bushes and trees.

Off-lying bank and rocks.—A coral bank, with a least depth of 7½ fathoms ($13^{m}7$) over it, lies one mile north-eastward of Yog point. The channel between them is deep in the fairway and clear of dangers.

Horadaba rocks are three bare rocks about 4½ miles eastward of Yog point; they lie close together, the middle one being 105 feet ($32^{m}0$) high, with brushwood on its summit.

Matulin rock, 6 cables south-eastward of Horadaba rocks, is 40 feet ($12^{m}2$) high. Between Horadaba and Matulin rocks are four rocks awash, and a number of sunken rocks.

Coast.—Between Bugao point and Anajao (Anahao) point, about

Charts 943, 1263.

Chart 3808.

5½ miles south-eastward, there is a bay, partly filled by Lete, Panay and some other small islands, and between them and the coast are Port Bagamanoc (Bagamanok), Babaguan bay, and Port Anajao (Anahao).

Tahidan point, about 2 miles southward of Bugao point, rises almost vertically to an elevation of 112 feet (34^{m}1); it is red-faced, very prominent, and has a conical summit, covered with grass. A reef, awash, extends three-quarters of a mile north-eastward and 3 cables eastward from Tahidan point.

Lete island, 329 feet (100^{m}3) high, lies about one mile eastward of Tahidan point. The northern and western sides of the island are bare, reddish-brown, vertical cliffs fringed by a reef. The south-eastern side is bordered by a sandy beach.

Panay island, about 2 cables eastward of Lete island, is 453 feet (138^{m}1) high, and partly wooded. On all sides, except the south-western, it is fringed by coral reefs extending as much as half a mile offshore. Macarilan islets, two in number, lie on the fringing reef about one cable northward of Macarilan point, the north-western extremity of Panay island; they are 139 and 90 feet (42^{m}4 and 27^{m}4) high, respectively, and densely wooded.

Port Bagamanoc (*Lat. 13° 57′ N., Long. 124° 17′ E.*), between Lete island and the coast of Catanduanes island westward of it, is open northward and affords no protection during the North-east monsoon. The anchorage area is much restricted by reefs extending from both sides, and by a rock, with a depth of one fathom (1^{m}8) over it, in the middle of the port.

Arch rock, 60 feet (18^{m}3) high, is a reddish-brown stone arch lying near the edge of the shore reef, about three-quarters of a mile south-south-eastward of Tahidan point. The plane of the arch is nearly east and west, and is a good mark.

A vessel with local knowledge bound into Port Bagamanoc should give Macarilan islets a berth of about half a mile and steer for the south-western point of Lete island, bearing 181°, until Arch rock bears 214°, when she should steer for it on this bearing, passing midway between the one-fathom (1^{m}8) rock in the middle of the port and the reef fringing the western side of Lete island. Anchorage may be obtained about a quarter of a mile eastward of Arch rock, in a depth of 3 or 3½ fathoms (5^{m}5 or 6^{m}4), mud, with good holding ground.

The town of Bagamanoc, which contains a church, stands at the head of Port Bagamanoc, about 1½ miles southward of Tahidan point. The town is nearly obscured behind a ridge of gravel which is covered with brushwood.

Babaguan bay, between the south-western side of Panay island and the coast of Catanduanes island, is very shallow, especially in the southern part, where extensive mud flats dry. Oco (Oko) river, navigable for small boats only, discharges into the southern part of this bay. A narrow channel, with a least depth of about 6 feet (1^{m}8), connects Port Bagamanoc with Port Anajao.

Port Anajao. — Light. — Dangers. — Port Anajao (Anahao), between the southern side of Panay island and Catanduanes island, is a small but well-sheltered harbour of refuge. The only entrance is from the eastward, the western end being blocked by the mud flats of Babaguan bay.

Lolong point, the south-eastern extremity of Panay island, is the

Charts 943, 1263.

Chart 3808.

northern entrance point of the port; it is 89 feet (27^{m}1) high, covered with grass, and terminates in cliffs, about 30 feet (9^{m}1) high. Komagat rock, 18 feet (5^{m}5) high, lies half a cable eastward of Lolong point, and is surrounded by rocks awash.

A light is exhibited, at an elevation of 110 feet (33^{m}5), from a white concrete beacon, on Lolong point.

Anajao point, the southern entrance point of Port Anajao, is 100 feet (30^{m}5) high, covered with grass, and lies 4¼ cables south-south-westward of Lolong point. Two islets lie about a quarter and three-quarters of a cable, respectively, eastward of Anajao point; the inner one is a bare rock, 28 feet (8^{m}5) high, the outer one being 58 feet (17^{m}7) high, covered with grass, brushwood, and a few palms.

Manyagui rock, 16 feet (4^{m}9) high, and dark-coloured, lies near the middle of the entrance to the port, about 4½ cables east-north-eastward of Anajao point. It is steep-to, except on the south-western side, and may be passed on either side, but the usual channel into the port is northward of the rock. This channel is a quarter of a mile wide and is deep in the fairway.

Both shores of the port are bold, well defined by low rocky cliffs, and the edges of the fringing reefs are steep-to. On each side of the port, abreast the narrowest part, are densely wooded hills, from 400 to 500 feet (121^{m}9 to 152^{m}4) high, the steep slopes of which clearly define the entrance.

Minaaso islet, 81 feet (24^{m}7) high, and densely wooded, lies at the head of the port, about 1¼ miles westward of Anajao point (*Lat. 13° 56′ N., Long. 124° 21′ E.*). It is bordered by cliffs and fringed by a reef, which extends about one cable north-eastward from it. A rock, 12 feet (3^{m}7) high, and several rocks, awash, lie on the fringing reef on the north-eastern side of the islet.

Near the head of the port on the northern side is a cove, at the head of which is Babaguan village. Several rocks, the outermost of which is awash, extend nearly three-quarters of a cable southward from the eastern entrance point of the cove.

Anchorage.—Directions.—Anchorage may be obtained by small vessels with local knowledge off the entrance to the cove at the head of which is the village of Babaguan, in a depth of 3½ fathoms (6^{m}4), mud.

A vessel entering Port Anajao should steer for Minaaso islet bearing 255°, just open of the southern shore, which leads about midway between Manyagui and Komagat rocks. As the narrows are approached, she should keep in mid-channel, and when Babaguan village opens, should steer for Omuntol point, the western entrance point of the cove in which that village is situated, and anchor with the stone building in the village bearing 001°.

Coast.—Between Anajao point and Lictin (Liktin) point, 7 miles south-south-eastward, and thence to Dalaynay point, nearly 4 miles farther southward, the coast is indented by numerous bays and fronted by a number of islets and rocks. The land is high and bold, and fringed by narrow, steep-to coral reefs. The bays are small and their shores are fringed with coral, leaving, in most cases, a narrow deep channel to their heads. They are all open northward and eastward, and afford no shelter during the North-east monsoon. All the headlands and islets on this stretch of coast can be safely passed at a distance of 1½ miles.

Charts 943, 1263.

Chart 3808.

Agutayan island, lying close offshore, about 3½ miles south-south-eastward of Anajao point, is 178 feet (54^{m}2) high, and almost entirely covered with grass. Several rocks, some awash, and others from 5 to 64 feet (1^{m}5 to 19^{m}5) high, lie close off the northern extremity of the island.

Sobok (Sobog) bay lies westward of Agutayan island. Linampanan island, 139 feet (42^{m}4) high and covered with grass, lies close northward of Sohoton point, situated 8 cables south-south-eastward of Agutayan island. A number of detached rocks, the highest of which has an elevation of 68 feet (20^{m}7), lie close northward and eastward of Linampanan island. Botinagan bay is entered between Agutayan and Linampanan islands.

Lictin point (*Lat. 13° 53′ N., Long. 124° 25′ E.*) is rugged and about 140 feet (42^{m}7) high. The cliffs are about 75 feet (22^{m}9) high, and the slopes leading to a hill, 376 feet (114^{m}6) high, three-quarters of a mile westward of the point, are covered with grass and trees. Bocana bay is entered between Conloy point, situated 1¼ miles southward of Sohoton point, and Minabat point, half a mile farther southward.

Bagalayag point, about 3 miles southward of Lictin point, is very prominent from northward or southward. It is composed of rugged cliffs, about 75 feet (22^{m}9) high, and is densely wooded, except for a small grassy area on the outer end. Rocks, the highest of which has an elevation of about 40 feet (12^{m}2), extend about a quarter of a mile eastward from the point. Sicmil (Sigmil) bay and Bedonogan, Sebonbon and Sioron coves lie between Lictin and Bagalayag points.

Pondanan island, half a mile northward of Bagalayag point, is 85 feet (25^{m}9) high, and covered with grass. Rocks, the highest of which has an elevation of about 20 feet (6^{m}1), lie close south-westward of the island. A shoal, with a depth of 2¾ fathoms (5^{m}0) over its south-western end, lies about 3½ cables northward of Pondanan island, and extends half a mile north-eastward, the outer edge lying nearly one mile from Catanduanes island. Pondanan island is connected to the coast westward by a shoal spit.

Dalaynay point, about three-quarters of a mile southward of Bagalayag point, is composed of low cliffs, as is also the coast between these two points; it rises to an elevation of 310 feet (94^{m}5) close within, and is covered with grass. A densely wooded hill, 430 feet (131^{m}1) high, lies about three-quarters of a mile south-westward of Bagalayag point.

Close eastward of Dalaynay point are the two Dalaynay islets. The northern and larger islet is 155 feet (47^{m}2) high, and has rugged cliffs; the southern islet rises to a sharp point, 78 feet (23^{m}8) high; both are covered with grass. Several bare rocks, the highest of which has an elevation of about 40 feet (12^{m}2), lie near these islets.

Gigmoto bay.—Gigmoto bay, entered between Dalaynay point and Macalanhag island, 8½ cables south-westward, affords excellent anchorage for small vessels with local knowledge.

Poro island, about 3½ cables south-south-eastward of Dalaynay point, is one of the most prominent landmarks on this coast. It has the appearance of a truncated cone, and is 189 feet (57^{m}6) high; a large single tree stands on its summit. The island is fringed by a reef extending about three-quarters of a cable offshore, except on the eastern side. There is a navigable channel about half a cable wide between Poro island and the Dalaynay islets.

Charts 943, 1263.

Chart 3808.

Macalanhag island, is 220 feet ($67^{m}1$) high, and densely wooded. It is fringed by a reef, which, on the south-western side of the island, dries and connects it to the south-western shore of the bay. The channel between the reef surrounding Macalanhag island and that extending from Poro island is half a mile wide, deep and free from danger.

Coral reefs fringe both shores of the bay, and from about abreast the north-western end of Macalanhag island the navigable channel between them is narrowed to a width of about 1¼ cables, with depths of from 5 to 6 fathoms ($9^{m}1$ to $11^{m}0$); from here the depths decrease gradually to the gravel beach at the head of the bay. The village of Gigmoto (*Lat. 13° 47′ N., Long. 124° 24′ E.*) stands at the head of the bay.

Anchorages.—Good anchorage may be obtained by vessels with local knowledge northward of the middle of Macalanhag island, in a depth of about 9 fathoms ($16^{m}5$), mud, but better protection will be found nearer the village.

Coast.—Nagsilag point, 72 miles south-south-westward of Dalaynay point, is a grassy hill, about 140 feet ($42^{m}7$) high, connected to the high land westward of it by a neck of land about 50 feet ($15^{m}2$) high. Sogocan and Diyoryan coves lie on the northern and southern sides, respectively, of Nagsilag point. Two bare rocks, 19 and 22 feet ($5^{m}8$ and $6^{m}7$) high, and steep-to, lie about 6½ cables north-eastward and 4 cables south-eastward, respectively, of Nagsilag point, and a rocky islet, 80 feet ($24^{m}4$) high, and covered with brushwood, lies about one cable southward of the point.

Bitaogan point, about three-quarters of a mile south-westward of Nagsilag point, is the eastern extremity of a densely wooded ridge extending 3 miles westward. This ridge is very prominent, particularly the western portion, and is visible from the vicinity of Nagumbuaya point (page 550). The valley between Nagsilag and Bitaogan points is well defined from seaward. Ginitligan cove lies about three-quarters of a mile south-westward of Bitaogan point.

Balacay (Balakay) island, about 1¼ miles southward of Bitaogan point, is 265 feet ($80^{m}8$) high near its south-western end and densely wooded. It is fringed by a reef, which dries, connecting it with Catanduanes island.

Agban bay, entered between Balacay island and Vinticayan point, about 4 cables southward, affords sheltered anchorage to small vessels with local knowledge during the South-west monsoon in moderate depths. Vinticayan point is composed of high rocky cliffs, with grass on its eastern extremity. Polalan bay lies between Vintacayan point and Mandag point, about 1¼ miles south-south-eastward.

Guinsaanan bay, entered between Mandag point and Binorong (Binurun) point, about a mile southward, is encumbered with reefs. Zayao islet, 80 feet ($24^{m}4$) high and bare, lies in the middle of the approach to the bay, and is connected to the northern shore by a reef which breaks in moderate weather. Binorong point is composed of high, dark coloured, rocky cliffs. A wooded peak, 266 feet ($81^{m}1$) high, about 1½ cables within the point, shows up well from northward or southward.

A rock, 18 feet ($5^{m}5$) high, lies about 1¾ cables south-south-eastward of Tominongton point, about 1¼ miles south-westward of Binorong point.

Charts 943, 1263.

Chart 3808.

Kalapadan bay. — Light. — Dangers. — Kalapadan bay is entered between Bandayanon point, situated about one mile west-south-westward of Tominongton point, and Taris point, about 2¼ miles farther in the same direction. The shores of the bay are fringed by reefs which extend half a mile off in places. Bandayanon point rises gradually to an elevation of 249 feet (75^m9). Pinohagan islet, 51 feet (15^m5) high, and wooded, lies on the edge of the fringing reef close south-westward of the point.

Jumbit (Humbit) islets (*Lat. 13° 38′ N., Long. 124° 23′ E.*), consisting of seven grassy islets and several bare rocks, lie within about one mile southward of Bandayanon point. The largest and highest islet has an elevation of 112 feet (34^m1). The group rises from a coral reef which extends about half a mile westward and a quarter of a mile eastward from the islets. The most dangerous part of the reef is at the north-western end, where there is a least depth of about one foot (0^m3), lying about 3 cables south-south-westward of Pinohagan islet.

Taris point is fringed by a reef which extends about one cable eastward and 2 cables from its north-eastern side. Maguinling islet, 40 feet (12^m2) high, and densely wooded, lies on this fringing reef, 2 cables northward of the point; it is not easily distinguished.

Minabalay islet, 59 feet (18^m0) high, and wooded almost to the water's edge, lies on the shore reef at the head of the bay, about 6 cables north-westward of Bandayanon point.

A detached reef, with a depth of 3 fathoms (5^m5) over it, and steep-to, lies on the western side of the channel leading to the anchorage three-quarters of a mile south-westward of Pinohagan islet. A 5-fathom (9^m1) patch lies three-quarters of a mile north-eastward of Maguinling islet, and a 4½-fathom (8^m2) patch about 4 cables north-north-eastward.

Baras, the largest town on the east coast of Catanduanes island, stands at the head of the bay between the mouths of the Paniginhan and Macutal rivers. A white galvanised iron roof at the eastern end of the town is prominent and is visible from the vicinity of Sinalog point, about 5 miles south-south-westward.

A light is exhibited, at an elevation of 70 feet (21^m3), from a white concrete beacon on a point about 6 cables north-north-westward of Bandayanon point.

Anchorages.—Directions.—Vessels with local knowledge may obtain anchorage, in a depth of 9 fathoms (16^m5), sand, 4½ cables westward of Pinohagan islet. Small craft may anchor, in a depth of 4 fathoms (7^m3) mud, midway between Minabalay islet and the eastern shore of the bay.

Vessels should approach Kalapadan bay with the light-structure bearing 026°, when well southward of Jumbit islets, and anchor when Pinohagan islet bears 091°.

Coast.—Cagaray point, three-quarters of a mile southward of Taris point, is a narrow, densely wooded neck of land, faced with bold rugged cliffs, about 85 feet (25^m9) high. Cagaray islet, close northward of Cagaray point, is low and covered with grass. Sinactan point, about 1¼ miles southward of Cagaray point, is a densely wooded neck of land, 175 feet (53^m3) high. Sinalog point lies about 1¼ miles southward of Sinactan point; the wooded slopes rising within the point terminate in a hill, 844 feet (257^m2) high, about half a mile north-westward.

Charts 943, 1263.

Chart 3808.

Locot bay is entered between Sinalog point and Nagumbuaya point, about 1½ miles southward. The shores are fringed with coral reefs, which, near the middle of the head of the bay, extend about 6 cables eastward, thus dividing the bay into two bights. Locot (Lokot) islets, two in number, lie on this reef extending eastward; they are 132 and 81 feet (40^m2 and 24^m7) high, respectively, rocky, and covered with bushes.

Buti hill, 500 feet (152^m4) high, and densely wooded, resembling a truncated pyramid, lies near the head of Locot bay. On its north-western slope is a well-defined hump, which shows up well from eastward or westward.

Nagumbuaya point (*Lat. 13° 33′ N., Long. 124° 21′ E.*) is the termination of a narrow strip of land which forms the southern side of Locot bay. It is very rugged, especially near the outer end, where rocky cliffs rise abruptly 100 feet (30^m5) or more. The land close within the point rises to an elevation of 375 feet (114^m3) and between this hill and another about half a mile farther inland the land is low and wooded. A rock, 35 feet (10^m7) high, and steep-to, lies close eastward of the point. The southern side of the point is steep-to.

Cabugao bay has been described on page 543.

LAGONOY GULF.—Lagonoy gulf, between Catanduanes island and the islands forming the northern side of Albay gulf, is about 21 miles wide at its entrance between Nagumbuaya point and Rapu Rapu island. In the middle of the gulf there are considerable depths, and there are no dangers outside a distance of 3 miles from its shores.

Northern side of Lagonoy gulf.—The southern side of Catanduanes island, which forms the outer part of the northern shore of Lagonoy gulf, has been described on pages 542-544.

Palag bay, entered between Rungus point (page 536) and Palag point, about 2¼ miles west-north-westward, affords good anchorage for vessels with local knowledge, sheltered from all winds except those from south-east.

Both entrance points are clear of dangers on their seaward sides. Rungus rock, above water, lies about 2 cables north-north-westward of Rungus point. A shoal, with a depth of 2½ fathoms (4^m6) over it, lies about a quarter of a mile from the eastern shore of the bay, about three-quarters of a mile north-westward of Rungus point. The head of Palag bay is fringed by a steep-to reef.

Guijalo (Guihalo) bay, entered about 2¾ miles westward of Palag point, affords anchorage for vessels with local knowledge, sheltered from north-easterly winds, but necessarily very close in on account of the great depths. The head of the bay is fringed by a steep-to reef. Port Minas is a snug cove close northward of Minas point, the western entrance point of the bay. The anchorage is close off the entrance to the cove. Guijalo (Guihalo) village is situated in the north-western corner of the bay. Vessels should be careful not to get too far northward as there are reefs in the bight and along the shore northward of the village.

Alto point, about 18 miles westward of Rungus point, is moderately high and steep-to.

Rosa islet is a low, wooded islet lying three-quarters of a mile east-south-eastward of Alto point. It is fringed by a reef which extends

Charts 943, 1263.

Chart 3808.

about 6½ cables eastward, 3 cables southward, and a less distance elsewhere. The reef is steep-to except for a patch, with a least depth of 1½ fathoms ($2^{m}7$) over it, situated a quarter of a mile northward of the eastern end of the reef, and there is a clear, deep channel half a mile wide, between the islet and the northern shore of the gulf.

Alto reef (*Lat. 13° 42′ N., Long. 123° 39′ E.*), part of which dries, lies about half a mile south-westward of Alto point, with a deep and clear channel between them. The channel between the reef and Rosa islet is about one mile wide and deep. Vessels passing northward of Rosa islet and Alto reef should keep about a quarter of a mile from the Luzon shore, which is clear of dangers and steep-to.

There is a pier, with a depth of 36 feet ($11^{m}0$) alongside, at Panagan, about 3½ miles west-north-westward of Alto point.

Sabang.—Light.—The town of Sabang stands on the southern side of the entrance to Lagonoy river, about 4½ miles westward of Alto point. It contains several large warehouses, a church, and an old stone fort. Sabang is the port for San José on Lagonoy river, about 4 miles south-westward.

A light is exhibited, at an elevation of 35 feet ($10^{m}7$), from a white concrete beacon, on the beach at Sabang.

Anchorage.—Good anchorage may be obtained, in depths of from 10 to 12 fathoms ($18^{m}3$ to $21^{m}9$), about half a mile offshore, with the church at Sabang bearing between 316° and 001°.

Chart 3818.

Southern side of Lagonoy gulf. — Light. — Dangers. — Rapu Rapu island, is the easternmost island on the southern side of Lagonoy gulf. Mount Rapu Rapu, 1,760 feet ($536^{m}4$) high, near the middle of the island, is the summit. The north-eastern side of the island is fringed by a narrow coral reef, which dries. Shoals, with depths of from 1¾ to 7 fathoms ($3^{m}2$ to $12^{m}8$) over them, lie within 2 miles of the same coast. Vessels are recommended to give this coast a wide berth.

Ungay (Ungai) point, the eastern extremity of Rapu Rapu island, rises to an elevation of 750 feet ($228^{m}6$), about three-quarters of a mile inland; it is steep-to, and prominent. Several rocks, about 20 feet ($6^{m}1$) high, lie about one cable from the point.

A light is exhibited, at an elevation of 305 feet ($93^{m}0$), from a white circular concrete tower, with dwelling, on Ungay point.

Batan island is separated from the western end of Rapu Rapu island by Rapu Rapu strait, which is described on page 555; Mount Viscaya, 1,300 feet ($396^{m}2$) high, situated about 1¼ miles northward of Bugton point, the southern extremity, is the summit of the island; the island is densely wooded. The northern coast between East point, the eastern extremity, and Kalanaga point, 4 miles west-north-westward, is bold and clear of dangers; thence westward to Mancao point, the western extremity, it is bordered by reefs which extend three-quarters of a mile offshore, and fronted by islands and reefs, the outer edges of which lie as much as 2¾ miles off the western part.

A shoal, with a depth of 27 feet ($8^{m}2$) over it, lies about one mile east-north-eastward of East point.

Kalanaga bay, entered between Kalanaga point and Sharp point, 6 cables south-westward, is a well-protected inlet with anchorage space for one or two vessels with local knowledge. The shores are fringed with reefs awash, leaving only a narrow channel to the head.

Chart 3818.

The edge of the fringing reef on the eastern side of the bay is marked by stakes. The surf breaks heavily on the western side of the entrance. The bay is backed by wooded hills, Mount Bilbao, situated about one mile west-south-westward of Sharp point, being 945 feet (288^{m}0) high, and is the summit of the peninsula between Kalanaga bay and Gaba bay, the next westward. There are a few huts on the low spit on the eastern side of the entrance.

Vessels with local knowledge may obtain anchorage eastward of Sharp point (*Lat. 13° 16′ N., Long. 124° 02′ E.*), in depths of from 9 to 10 fathoms (16^{m}5 to 18^{m}3).

Gaba bay is entered between Nanlampalay (Nanlampalai) point, 2¼ miles west-north-westward of Kalanaga point, and Labcan point, about one mile farther in the same direction. The shores are fringed with reefs and the entrance encumbered with shoals, so that only vessels with local knowledge should attempt to enter; there is, however, a good protected anchorage inside, in a depth of about 9 fathoms (16^{m}5).

Guinanayan island and Cagbulauan (Kagbulauan) island, 252 feet (76^{m}8) high, both wooded, lie northward of the western part of Batan island, and in the northern end of Cagraray pass. They are surrounded by reefs which extend half a mile on the seaward side. Good protected anchorage for small craft may be obtained between the south-eastern end of Guinanayan island and Labcan point, but local knowledge is necessary, as the entrance is narrow and bordered by reefs.

Cagraray (Kagraray) island, north-westward of Batan island, is densely wooded, and 1,260 feet (384^{m}0) high near the middle. The northern shore is fringed by a reef which extends as much as one mile offshore. A 6-fathom (11^{m}0) patch lies about 3¼ miles north-westward of Tumaras point, the north-eastern extremity of Cagraray island, and about 1½ miles offshore. Cagraray pass, separating Batan and Cagraray islands, is encumbered with reefs. Casolgan (Kasolgan) pass, between Cagraray and San Miguel islands, nearly dries.

Charts 3818, 3808.

San Miguel island, close north-westward of Cagraray island, is 400 feet (121^{m}9) high at its south-eastern extremity, and densely wooded. The north-eastern side is fringed by a reef, which dries, extending one mile offshore in places. A shoal, with a depth of 6 fathoms (11^{m}0) over it, lies about 2 miles northward of Budias point, the eastern extremity of San Miguel island. San Miguel point, the north-western extremity of the island, is fringed by a reef, which dries, extending about half a mile northward and three-quarters of a mile westward, with some rocks, awash, near the edge in the latter direction.

Tabaco bay.—Lights.—Dangers.—Tabaco (Tabako) bay is a capacious harbour with considerable depths, lying between the coast of Luzon and the western sides of San Miguel and Cagraray islands. The shores on both sides of the bay are steep-to.

A 4-fathom (7^{m}3) patch lies about one mile north-westward of San Miguel point, and a bank, on which there are depths of from 3 feet to 9 fathoms (0^{m}9 to 16^{m}5), extends from a position about 1¾ miles north-westward of the same point for a distance of about 3¼ miles north-westward, leaving a deep, but narrow channel between its north-western end and the coast of Luzon, about 2 miles south-eastward of Tiwi point (*Lat. 13° 29′ N., Long. 123° 40′ E.*). There is a sand

Charts 943, 1263.

Charts 3818, 3808.

cay near the north-western end of the bank. The fairway into Tabaco bay lies between the 4-fathom (7m3) patch and the south-eastern end of the bank.

On the western shore of the bay are the towns of Malinao, Tabaco (Tabako), Malilipot and Bacacay (Bakakai), situated about 5¼, 8 and 10½ miles, respectively, south-eastward of Tiwi point.

Leading lights are situated at Malinao; the front light is exhibited, at an elevation of 36 feet (11m0), from a white concrete pillar, on the ruins of a fort on the beach north-eastward of the town of Malinao; the rear light is exhibited from the belfry of the church at Malinao.

Chart 3818.

The town of Tabaco is of considerable commercial importance, large quantities of hemp being shipped from there. There is a concrete pier, 350 feet (106m7) long, with a depth of 29 feet (8m8) at its head, connected to the shore by two causeways. Water is laid on to the pier. The harbour is open to foreign shipping. *See* page 3.

A reef extends about three-quarters of a mile north-eastward from the western side of the head of Tabaco bay, about one mile eastward of Bacacay. Buguias islet, low and flat-topped, lies on this reef about half a mile from its outer end. Between this reef and the head of the bay there are several islets and shoals, beyond the track of ordinary navigation.

Pili bay, entered about 2 miles east-south-eastward of Bacacay, is a lagoon extending from the southern side of the head of Tabaco bay almost to Albay gulf, from which it is separated by a narrow gravel bank, about 6 feet (1m8) high. Sula channel, entered about one mile eastward of the entrance of Pili bay, connects the head of Tabaco bay with the northern side of Albay gulf; it is a narrow and tortuous channel about 4 miles in length, practicable only for small craft with local knowledge, with a least depth of 5 feet (1m5). The tidal streams meet in the middle of the channel and run at a considerable rate.

Charts 3818, 3808.

Anchorage.—Directions.—Anchorage may be obtained by vessels with local knowledge, in depths of from 25 to 30 fathoms (45m7 to 54m9), sand and mud, from one to 1½ cables from the pier at Tabaco.

A vessel approaching Tabaco bay should keep the light-structure and the belfry of Malinao church in line, bearing 240°, before Tiwi point bears more than 294°, which leads 3 cables north-westward of the 4-fathom (7m3) patch in the entrance. When Tabaco church bears 186°, she should steer to pass close eastward of Baculud (Bakulud) point, about 2¾ miles south-eastward of Malinao light tower (*Lat. 13° 24′ N., Long. 123° 43′ E.*) and thence to the anchorage.

Chart 3808.

Head of Lagonoy bay.—Tiwi point is a rocky headland, 438 feet (133m5) high. The shore thence to the south-eastern entrance point of Atulayan bay, 8 miles north-westward, consists mostly of bold rocky points or headlands interspersed with sand and gravel beaches. There is very little coral along this shore, except near Tiwi point, and westward of Gorda point, 7 miles north-westward.

Atulayan bay, entered between a point one mile west-north-westward of Gorda point and Sagnay point, 2½ miles north-north-westward, has considerable depths. The shores are mostly fringed by a narrow reef. Atulayan island, 693 feet (211m2) high, lies in the middle of the

Charts 943, 1263.

Chart 3808.

entrance ; it is fringed by a narrow, steep-to reef. A reef, with a least depth of 2 fathoms ($3^{m}7$) over it, lies about a quarter of a mile from the middle of the south-western side of the island, and a reef, with a least depth of one fathom ($1^{m}8$) over it, lies the same distance from the north-western side. There is a deep channel between the latter reef and Atulayan island and also between the reef and the coast of Luzon.

Vessels with local knowledge may obtain well-protected anchorage, in a depth of about 20 fathoms ($36^{m}6$), soft bottom, in the southern part of Atulayan bay, about 4 cables offshore, with Sagnay point bearing 012°, and the south-eastern entrance point, 098°. A fairly protected anchorage may be obtained, in a depth of about 23 fathoms ($42^{m}1$), off the western point of Atulayan island. The bay may be entered on either side of Atulayan island, but vessels using the northern entrance should keep close to Sagnay point.

Between Sagnay point (*Lat. 13° 36′ N., Long. 123° 33′ E.*) and Sabang, 7½ miles northward, the shore is low, sandy, and steep-to. A reef, on which there are some rocks above water, extends about half a mile northward from Sagnay point. The town of Sagnay stands about 1½ miles westward of Sagnay point, and Nato village, on the northern bank of Nato river, which discharges on the northern side of Sagnay point, about three-quarters of a mile from the mouth.

A shoal at the mouth of Nato river is marked by a black can buoy.

Anchorage may be obtained by vessels with local knowledge, in a depth of 4 or 5 fathoms ($7^{m}3$ or $9^{m}1$), about half a mile north-eastward of Nato village, or in a depth of 14 fathoms ($25^{m}6$), with Atulayan island bearing 148°, and Rosa islet, 054°.

Mount Isarog, 10 miles west-north-westward of Sagnay point, has been described on page 529.

Chart 3818.

ALBAY GULF.—Albay gulf, bounded on the north by Rapu Rapu, Batan, and Cagraray islands, and on the west and south by the coast of Luzon, is entered between Ungay point (page 551) and Bingay (Bingai) point, 7 miles south-south-westward, or by vessels with local knowledge through Rapu Rapu strait. The shores are mostly steep-to and the depths considerable, but at the head of the gulf there are several dangerous reefs, lying as much as 3 miles offshore.

The southern side of Rapu Rapu island is clear of dangers except for an extensive reef, which dries, extending three-quarters of a mile offshore in front of the town of Rapu Rapu, over a distance of 2½ miles. On its outer edge, abreast the western end of the town, are two rocks, about 20 and 30 feet ($6^{m}1$ and $9^{m}1$) high. There is a small bay affording anchorage close eastward of the eastern end of the reef, protected from south-westerly winds. There is a narrow channel entered from westward, between the reef and the southern side of the island, which leads to within half a mile of the town.

Babayon point, the western extremity of Rapu Rapu island, is about 145 feet ($44^{m}2$) high, and well wooded. It is fringed by a reef which extends about one cable offshore.

Bingay point is fringed by a reef which extends about 3½ cables from its northern side. The coast southward of the point is described on page 426. From Bingay point to Pagjuriran (Paghuriran) point,

Charts 943, 1263.

Chart 3818.

the eastern entrance point of Sugot bay, 4¾ miles westward, the shore is fringed by a reef which extends about half a mile off in places.

Sugot bay, entered between Pagjuriran point and Papucha point, about 3 miles south-westward, has considerable depths in the middle. The shores are fringed with reefs, which, on the western and southern sides, extend about half a mile offshore. The village of Esteban is situated on the eastern side of the bay, 2¼ miles southward of Pagjuriran point. Anchorage may be obtained about one mile from the head of the bay, in depths of from 12 to 15 fathoms ($21^{m}9$ to $27^{m}4$), mud, but vessels should be careful to avoid the rock, with a depth of about one foot ($0^{m}3$) over it, situated about half a mile from the eastern shore of the bay and one mile from the head.

The town of Bacon (Bakon) is situated about 1¼ miles west-north-westward of Papucha point. There is a break in the shore reef abreast it, through which boats may reach the town. In the town is a church with a dome, and about one mile westward is a hill, 360 feet ($109^{m}7$) high, both of which are good landmarks. The land southward of Bacon is low and flat.

The submarine cable from Legaspi is landed at Bacon.

The anchorage off Bacon is bad, being exposed to north-easterly and easterly winds and seas. Vessels may obtain anchorage off the town, three-quarters of a mile offshore, in depths of from 12 to 15 fathoms ($21^{m}9$ to $27^{m}4$), mud and sand, with the church dome bearing 181°. Small vessels may anchor a quarter of a mile offshore, in a depth of 5 fathoms ($9^{m}1$), sand, on the same bearing, but the holding ground is indifferent.

The southern shore of Albay gulf from Bacon to Cauit (Kauit) point (*Lat. 13° 08′ N., Long. 123° 52′ E.*), 12 miles north-westward, is fringed by a narrow reef. Gajo (Gaho) point, 7¼ miles north-westward of Papucha point, is steep-to and clear of dangers. Near the shore, 3¾ miles west-north-westward of Gajo point, is a hot spring.

Rapu Rapu strait, entered from southward between Babayon point and Bugton point, 2¼ miles west-north-westward, is described below.

The southern side of Batan island is steep-to and clear of dangers, except for a reef lying with its outer edge about 4 cables offshore in the south-western approach to a bight about midway along this coast. Anchorage may be obtained by small vessels with local knowledge sheltered from northerly winds, in this bight. The eastern shore and head of the bight are fringed with a reef, on the western edge of which there is a rock, about 23 feet ($7^{m}0$) high.

Coal harbour, entered between Binalbagan point, the south-western extremity of Batan island, and Cagraray point, the south-eastern extremity of Cagraray island, is described on page 556.

Between Cagraray (Kagraray) point and Cabadea (Kabadea) point, about 2½ miles west-south-westward, the southern coast of Cagraray island is high, well wooded, and indented by several bights which are fringed with coral reefs. A detached reef, awash, lies with its outer edge, about 4 cables offshore, about three-quarters of a mile south-westward of Cagraray point, and a 16-foot ($4^{m}9$) patch lies 4 cables south-south-westward of the point.

Rapu Rapu strait.—Dangers.—Beacons.—Buoy.—Rapu Rapu strait is tortuous and encumbered with numerous reefs, but there is a good channel through it, with a least depth of 3½ fathoms ($6^{m}4$).

Charts 3808, 943, 1263.

Chart 3818.

Babayon reef, which partly dries, lies about 4 cables west-south-westward of Babayon point. Columbia reef, with a least depth of 5 feet (1^m5) over it, lies about one mile westward of Babayon point. A shoal, with a least depth of 16 feet (4^m9) over it, lies 6½ cables north-westward of Babayon point, and two shoals, each with a depth of 22 feet (6^m7) over it, lie about half a mile northward of the same point. A shoal, with a least depth of 25 feet (7^m6) over it, lies nearly one mile north-eastward of Babayon point. Derickson reef, which is partly awash, lies about 1½ miles north-eastward of Babayon point. A red conical buoy, No. 2, is moored about one cable southward of the part which is awash.

The above-mentioned dangers, with the exception of Babayon reef, lie on the northern side of the fairway.

Middle reef, on the western side of the fairway, 1½ miles southward of East point (*Lat. 13° 16′ N., Long. 124° 06′ E.*), of Batan island, is awash, and breaks heavily during the North-east monsoon. A shoal, with a least depth of 22 feet (6^m7) over it, lies a quarter of a mile eastward of the northern extremity of Middle reef; the fairway through the strait lies between them. A reef, which dries, lies 4 cables eastward of Middle reef.

Two leading beacons, the rear one situated on the northern coast of Rapu Rapu island, about 2¼ miles east-north-eastward of Babayon point, and the front one on the edge of the reef which fringes that coast, in line, bearing 186°, lead through the fairway between Middle reef and the shoal, with a depth of 22 feet (6^m7) over it, eastward of it. The front beacon consists of a white triangle, point up, 14 feet (4^m3) high, and the rear beacon a white diamond shape, 20 feet (6^m1) high.

Directions.—A vessel with local knowledge entering Rapu Rapu strait from Albay gulf should pass between Babayon and Columbia reefs, thence southward of No. 2 buoy, thence she should steer north-eastward until the leading beacons on Rapu Rapu island are in line, when she should keep them in line astern, bearing 186°, until well clear of the shoals north-eastward of Middle reef, when she may alter course north-eastward.

Tidal streams.—The tidal streams in Rapu Rapu strait have been observed to attain a rate of 1½ knots.

Batan harbour.—**Beacons.**—Batan harbour, on the north-western side at the south-western end of Rapu Rapu strait, about one mile northward of Babayon point, affords good anchorage for vessels with local knowledge, well protected from wind and sea. The entrance between the reefs is marked by a red beacon on the north-eastern side and a black beacon on the south-western side. The village of Anonang or Batan is situated at the head of the harbour.

Coal harbour.—**Dangers.**—**Beacons.**—Coal harbour, forming the southern end of Cagraray pass (page 552), extends about 2 miles north-westward, beyond which it is encumbered with reefs. The south-western side of Batan island is fringed by reefs, which extend 3 cables offshore about half a mile north-westward of Binalbagan point, and about half a mile offshore at Liguan point, about 2¼ miles farther north-westward. In the middle of the latter reef, which dries, there is a rock, 20 feet (6^m1) high. Some detached shoals, with depths of from one foot to 22 feet (0^m3 to 6^m7) over them, lie within 4 cables

Charts 3808, 943, 1263.

Chart 3818.

of the north-eastern shore south-westward and southward of Tinukawan point, about three-quarters of a mile south-eastward of Liguan point.

Cagraray point is fringed by a reef which extends about a quarter of a mile; a detached shoal, with a depth of 4 feet (1^m2) over it, lies about 3½ cables east-north-eastward of the point.

A 13-foot (4^m0) patch lies on the western side of the fairway, 7 cables west-south-westward of Liguan point.

A small stone pier, with a least depth of 26 feet (7^m9) alongside, is situated 3½ cables north-westward of Liguan point.

The entrance to the inner harbour, at the head of Coal harbour, is marked by three white concrete beacons, two of them surmounted by red cones and one by a black drum.

Anchorages.—Anchorage may be obtained by large vessels, in depths of from 25 to 30 fathoms (45^m7 to 54^m9), mud, sheltered from all winds, except those from south-eastward, in the south-eastern part of Coal harbour.

Small vessels with local knowledge may obtain good sheltered anchorage, in a depth of 18 fathoms (32^m9), in a bight fringed by coral reefs off the pier.

Port Sula.—Light.—Port Sula, forming the southern end of Sula channel (page 553), is entered on the western side of Cabadea point. It is well sheltered, has good holding ground, and is used as a harbour of refuge by vessels of moderate size with local knowledge. It is about a quarter of a mile wide at its entrance and deep in the middle. The navigable channel has a least width of about three-quarters of a cable as far as Picadero point, on the western shore, nearly one mile northward of the entrance, where it narrows and shoals.

A light is exhibited, at an elevation of 53 feet (16^m2), from a white post, on Cabadea point (*Lat. 13° 14′ N., Long. 123° 52′ E.*).

Poliqui bay.—Dangers.—Poliqui (Poliki) bay, in the south-western corner of Albay gulf, is entered between Cauit point (page 555) and Lubas point, 5 miles westward.

Cauit point is low, covered with mangroves, and fringed by a reef, which extends about 6 cables north-north-westward. Manito reef, with a least depth of 9 feet (2^m7) over it, lies with its northern edge about one mile west-north-westward of Cauit point. Cauit reefs consist of two reefs separated by a deep narrow channel lying about half a mile southward of Manito reef; the northern reef has a least depth of one foot (0^m3) over it, and the southern reef a least depth of 3 feet (0^m9). Lubas point is fringed by a reef which dries, extending about half a mile northward.

Poliqui (Poliki) reef, with a least depth of 16 feet (4^m9) over it, lies in the middle of the northern approach to Poliqui bay, about 3 miles westward of Cauit point.

The shores of the bay are fringed with reefs, which are comparatively narrow on the eastern side. The middle of the bay has considerable depths and is clear of dangers.

Head of Albay gulf.—Dangers.—Libog is a small town in the north-western corner of Albay gulf, 5½ miles westward of Cabadea point. It contains a church, which is a good landmark. The coast close north-eastward of the town is fringed by a reef, which dries, extending a quarter of a mile offshore.

Mayon volcano, about 5½ miles westward of Libog, is the most

Charts 3808, 943, 1263.

Chart 3818.

prominent landmark in this part of Luzon; it forms a perfect cone, 7,943 feet ($2,421^{m}0$) high, and at times emits a considerable amount of vapour.

Mount Linguion, a conical, wooded hill, 555 feet ($169^{m}2$) high, lies about 5 miles south-south-westward of Libog.

Catubeg (Katubeg) reef, with a depth of 10 feet ($3^{m}0$) over it, lies 4¼ miles north-westward of Cauit point.

A rock, with a depth of 13 fathoms ($23^{m}8$) over it, was reported, in 1942, to lie about one mile west-north-westward of Catubeg reef.

Barao reef, with a least depth of about 4 feet ($1^{m}2$) over it, lies about half a mile south-westward of Catubeg reef. A 7-fathom ($12^{m}8$) patch lies between these two reefs. A bank, with a depth of 10 fathoms ($18^{m}3$) over it, was reported, in 1948, to lie about 9 cables north-westward of Barao reef.

Denson reef, with a least depth of about 4 feet ($1^{m}2$) over it, lies about 2 miles north-north-eastward of Lubas point. It can usually be plainly distinguished by the discoloured water.

Legaspi reef, with a depth of 15 feet ($4^{m}6$) over it, lies 8½ cables northward of Lubas point (*Lat. 13° 08′ N., Long. 123° 47′ E.*). Between the reef, which extends northward from Lubas point, and Legaspi reef there is a deep channel about a quarter of a mile wide.

A reef, on which there are some rocks, awash, lies with its outer edge about 4 cables offshore, about 1¼ miles northward of Legaspi light-structure.

Capuntucan point, about 1½ miles north-westward of Lubas point, is 222 feet ($67^{m}7$) high and steep; from a distance it appears as a prominent sharp-pointed white cliff. Macabalo river discharges close southward of the point.

Port of Legaspi.—Light.—The port of Legaspi, situated close northward of Capuntucan point, is the principal port on the east coast of Luzon; it is open to foreign shipping. There is a basin formed by breakwaters, with an entrance, 120 yards ($109^{m}7$) wide; inside the basin there was, in 1947, a least depth of 19 feet ($5^{m}8$), and alongside the concrete wharf, 21½ feet ($6^{m}6$). The wharf cannot be used by vessels over 350 feet ($106^{m}7$) in length. Water is laid on to the wharf. There are several smaller wharves.

A light is exhibited, at an elevation of 59 feet ($18^{m}0$), from a white steel framework structure, situated about half a mile northward of the town of Legaspi.

Anchorage.—Directions.—Anchorage may be obtained off Legaspi, in depths of from 17 to 22 fathoms ($31^{m}1$ to $40^{m}2$), about 1½ cables offshore; the bottom is volcanic sand, rocks, and mud in places, the depths are irregular, and the holding ground is poor. The anchorage is open eastward, and during the North-east monsoon a heavy sea often sets in.

A buoy, surmounted by a red flag, is usually moored about 700 feet ($213^{m}4$) from the end of the wharf to which a vessel is to secure, to act as a distance indicator; a white flag is displayed from the end of the same wharf.

Vessels bound to Legaspi usually skirt the northern shore of Albay gulf at a distance of at least one mile, until the port of Legaspi bears 211°, when it is steered for. The anchorage may be approached directly by steering for Legaspi light-structure (*Lat. 13° 09′ N., Long.*

Charts 3808, 943, 1263.

Chart 3818.

123° 45′ E.), bearing about 255°, which leads midway between Barao and Denson reefs. In the daytime, the church at Daraga, situated about 2½ miles westward of the light-structure, and which is very prominent, bearing 257°, just open northward of the light-structure, is a good leading mark for this channel. Vessels may also approach the anchorage by passing southward of Denson reef.

Pilotage.—Pilotage is compulsory for merchant vessels.

Legaspi.—The town of Legaspi is the capital of the province of Albay. It is the terminus of the railway from Manila. There is a hospital in the town.

Storm signals.—Storm signals are shown at Legaspi, *see* page 11.

Radio station.—There is a radio station at Legaspi, *see* page 14.

Climatic table.—*See* page 36.

Charts 3808, 943, 1263.

CHAPTER XII

EAST, SOUTH, AND SOUTH-WEST COASTS OF SAMAR—EAST COAST OF LEYTE—SURIGAO STRAIT—EAST COAST OF MINDANAO

Chart 3808.

EASTERN SIDE OF SAMAR.—Coast.—Bacan (Bakan) island is connected by a reef to the north-eastern point of Samar, about 2¾ miles eastward of Tabogan point, the south-eastern extremity of Batag island (page 434). It is mostly low and wooded, except near the centre, where there is a grassy hill, 170 feet ($51^{m}8$) high, covered with trees. It is fringed by reefs which extend as much as half a mile offshore.

Palahan islet, from which a reef extends a quarter of a mile northward, lies one mile west-south-westward of the southern extremity of Bacan island and about 4 cables from the coast of Samar.

Climate and weather.—*See* page 16.

Off-lying dangers.—A rock, with a depth of 4 feet ($1^{m}2$) over it, lies one mile westward of the southern point of Bacan island, and about one cable east-south-eastward of this rock is another which dries 2 feet ($0^{m}6$).

A shoal, with a depth of 2¼ fathoms ($4^{m}1$) over it, lies about three-quarters of a mile north-north-westward of the northern point of Bacan island. About 2 miles northward and 1¼ miles north-eastward of the same point are rocky patches, with depths of 4 and 5 fathoms ($7^{m}3$ and $9^{m}1$) over them, respectively. About 2¼ miles eastward of the northern end and about 3 miles eastward of the southern end of Bacan island are two patches, with depths of 6 and 8 fathoms ($11^{m}0$ and $14^{m}6$) over them, respectively. The water in this vicinity is very clear, and the bottom can frequently be seen in a depth of 10 fathoms ($18^{m}3$).

Coast.—Between Bacan island and Sila point (*Lat. 12° 24′ N., Long. 125° 20′ E.*), about 16 miles south-eastward, the coast is clear of off-lying dangers, except those described above, and may be approached to a distance of one mile. From the point southward of Bacan island to Oacan point, one mile south-eastward, the coast is low and bordered by a sandy beach, interspersed with mangroves growing on the coral reef which fringes it. Oacan point is low, but close south-eastward of it the land rises steeply to the summit of Cape Espiritu Santo, 2½ miles south-eastward, which rises to a height of 1,481 feet ($451^{m}4$), about three-quarters of a mile southward of its extremity, and is densely

Charts 943, 1263.

Chart 3808.

wooded to the water's edge. The coral reef at Oacan point extends half a mile offshore. From north-eastward two summits are visible of nearly equal elevation, the higher being south-eastward.

About 1½ miles south-eastward of Cape Espiritu Santo, close offshore and under the cliffs, and connected to them at low water, lies the northernmost high pyramidal rock of the many which give a distinctive character to the coast thence to Manjud point, 7¾ miles south-eastward of Cape Espiritu Santo, and which are from 10 to 184 feet ($3^{m}0$ to $56^{m}1$) high. When close offshore at either end of this stretch of coast these rocks present an imposing appearance.

Dapdap bay, entered about 1¾ miles south-eastward of Cape Espiritu Santo, lies at the opening of a small valley. The shores are fringed with coral, and it affords no anchorage. Foul ground extends from both entrance points. Finch rock, 5 feet ($1^{m}5$) high and steep-to, lies close outside the foul ground about 5½ cables north-eastward of the north-western entrance point. Another rock, also 5 feet ($1^{m}5$) high, and steep-to, lies nearly in the middle of the northern approach to the bay about 6 cables eastward of the same point. Cube rock, 27 feet ($8^{m}2$) high, and steep-to on its seaward side, lies on the outer edge of the foul ground extending about 3 cables north-eastward from the south-eastern entrance point. Kabatoan (Kabatuan) village stands at the head of the bay. A black rock, 40 feet ($12^{m}2$) high, marked by a coloured patch, lies about 3½ cables southward of Cube rock, and a black conical rock, 150 feet ($45^{m}7$) high, which is prominent, lies on the edge of the coastal reef, about 1¾ miles farther south-eastward.

Mapanas bay is entered about 3¾ miles south-eastward of Dapdap bay. The entrance, which is about three-quarters of a mile wide, is contracted by reefs and rocks extending from both sides. Inside, the fringing reefs from both sides almost meet, leaving a narrow channel to the head, where small craft with local knowledge can obtain shelter. Mapanas village stands at the head of the bay, where there is a sandy beach through which two small streams discharge.

Manjud (Manhud) point (*Lat. 12° 28′ N., Long. 125° 17′ E.*) is formed by a spur running north-eastward from the interior mountain chain. The extremity of the point has a perpendicular face, over 50 feet ($15^{m}2$) high, and is steep-to. Between Manjud point and the south-eastern entrance point of Mapanas bay, some rocks, about 50 feet ($15^{m}2$) high, lie about 4 cables offshore, and several other rocks, the highest of which has an elevation of 184 feet ($56^{m}1$), lie on the coastal reef westward of them. From a point lying about 6½ cables southward of Manjud point, a reef and some low rocks extend half a mile eastward, with a rock, awash, at the outer end, and another rock awash about 2 cables northward of it.

Sacamalig (Sakamalig) bay is entered between Manjud point and Sila point, 4¾ miles south-eastward. Canmanai rocks, 20 feet ($6^{m}1$) high, lie about one mile southward of Manjud point, about 3½ cables offshore. The northern and southern sides of the bay are fringed with reefs, and in the middle part there is a sandy beach, off which vessels with local knowledge may obtain anchorage, in a depth of 10 fathoms ($18^{m}3$), sand, half a mile offshore.

Sila point, which separates Sacamalig and Gamay bays, appears like three pyramidal hills from north-westward or south-eastward, the highest and westernmost of which has an elevation of 554 feet

Charts 943, 1263.

Chart 3808.

(168^{m}9). Northward of the point on the fringing reef, which extends a quarter of a mile offshore, are several pointed rocks; others lie within a quarter of a mile eastward of the point. Sora cay (*see* below), bearing 149°, open north-eastward of Higunum rock, leads north-eastward of all dangers off Manjud and Sila points.

Gamay bay.—Dangers.—Gamay bay, entered between Sila point and Hiuinatungan island, about 7½ miles south-south-eastward, is encumbered with reefs and dangerous to navigate. The shores of the bay are indented by several smaller bays, the points between which are fringed by drying reefs. Many of the reefs, with depths of from one to 2 fathoms (1^{m}8 to 3^{m}7) over them, do not break in ordinary weather.

Higunum rock, 1½ miles south-eastward of Sila point, is a flat rock, 26 feet (7^{m}9) high, over which the sea breaks in heavy weather; it is steep-to on all sides.

Sora cay, about 3½ miles south-eastward of Sila point, lies on a reef which extends about three-quarters of a mile westward and south-south-eastward from the cay; it is a low sandy islet which changes its shape with every gale. A wreck, situated on the eastern end of the cay, is prominent. Vessels should give the cay a berth of at least one mile if passing eastward of it. Several detached shoals, with depths of from 1½ to 3 fathoms (2^{m}7 to 5^{m}5) over them, lie between Sora cay and the coast westward.

A sand cay fringed by a reef which dries, lies about 4 miles south-south-westward of Sila point and about 8 cables from the south-western shore of the bay.

Canabayon island, low and wooded, lies about 4¼ miles southward of Sila point. It has a sandy beach and is fringed by a coral reef, except on the southern side; it is the only island of its kind in the bay. Nanuntugan reef, which dries, lies about 6 cables eastward of Canabayon island and about the same distance from the reef which fringes the southern shore of the bay. Two detached reefs lie about one mile northward of the island.

The village of Gamay stands at the mouth of the river of the same name, 2½ miles south-westward of Sila point (*Lat. 12° 24′ N., Long. 125° 20′ E.*). Good anchorage may be obtained by vessels with local knowledge off Gamay during the South-west monsoon, but with an easterly swell it is not safe. On the northern and southern sides respectively, of Salinsagin point, situated 4½ miles south-westward of Sila point, are Cagamutan (Kagamotan) and Saonloc bays, and about half a mile south-south-eastward of the latter bay is the entrance to Lapinig bay. They are all open eastward.

Helm harbour is separated from Lapinig bay by Barabod point, a low point, covered with mangroves, with some scattered trees near its extremity. It affords a good typhoon anchorage for moderate-sized vessels with local knowledge about 1¼ miles south-south-eastward of Barabod point.

Nabugtusan island, forming the eastern side of Helm harbour, is 144 feet (43^{m}9) high, near the middle, but the part which forms the eastern entrance point of the harbour is low and covered with mangroves. At high water there is a boat channel southward of the island between Helm harbour and San Ramon bay. Binarayan island is separated at high water from the eastern side of Nabugtusan island by

Charts 943, 1263.

Chart 3808.

Nabugtusan channel, which is narrow. The island is composed of low coral, covered with mangroves. Nabugtusan and Binarayan islands are fringed on the northern and eastern sides by a reef which dries, extending from 1½ to 4½ cables offshore.

San Ramon bay is entered between Binarayan island and Hiuinatungan island, about three-quarters of a mile eastward. About midway between the entrance and the head of the bay, a branch extends westward, which affords a contracted but safe anchorage during typhoon weather for small vessels with local knowledge; it is, however, much encumbered with reefs which fringe the shores. Hiuinatungan island is low, covered with mangroves, and difficult to identify from seaward; a reef extends three-quarters of a mile north-eastward from it. San Ramon village stands on the western shore at the head of San Ramon bay.

A rock, with a depth of 4 feet ($1^{m}2$) over it, is reported in the passage southward of Hiuinatungan island; the fairway lies on the northern side of the rock.

Coast.—The coast between a point southward of Hiuinatungan island and Bunga point, about 9½ miles south-eastward, is bordered with mangrove, but a short distance within, the land rises gradually to a level wooded ridge. The coast is fringed by a coral reef, which dries, and is steep-to, extending 1½ miles offshore at the north-western end and gradually narrowing to three-quarters of a mile at the south-eastern end. There are four breaks in this reef, leading to small bays and streams, but they are exposed and of no use to shipping.

Bunga point is low, and covered with mangroves, but rises northward to a ridge about 50 feet ($15^{m}2$) high, and covered with trees, mostly coconut palms. The point 1¼ miles northward of Bunga point is easily identified by a group of large coral boulders lying on the reef over three-quarters of a mile eastward of the point. A rock, 20 feet ($6^{m}1$) high, lies on the edge of the coastal reef about one mile south-eastward of this point. The boulders are a prominent landmark for vessels approaching from north-westward or south-eastward on account of their jagged outlines and apparently long distance from the coast when first raised above the horizon.

Apiton island, half a mile south-eastward of Bunga point, is 113 feet ($34^{m}4$) high at its south-eastern end, and slopes gradually north-westward. It is densely wooded, mostly with coconut trees, and is fringed by a reef, on which, eastward and southward of the island are many large rocks. Off the south-eastern point of the island, on the fringing reef, is a prominent rock, 63 feet ($19^{m}2$) high and steep-to on its southern side. Between the reef fringing the island and Bunga point (*Lat. 12° 10′ N., Long. 125° 31′ E.*) there is a narrow boat channel.

Anchorage may be obtained by vessels with local knowledge, protected from easterly winds and seas, in a depth of 10 fathoms ($18^{m}3$), mud, off the western side of Apiton island.

Between Bunga point and Cabra point, about 6½ miles southward, the coast is indented by several bays, separated by low points covered with mangroves, and fringed by coral reefs, and there are many detached sunken reefs, some of which lie one mile offshore. Within the mangroves are coconut trees, and the high land is covered with dense forests. Oras bay is the only one of any commercial importance, and Bactol bay, close southward of it, alone affords good anchorage.

Charts 943, 1263.

Chart 3808.

San Policarpo bay is entered between Bunga point and Binugayan point, about three-quarters of a mile westward. The shores are fringed with drying reefs and the bay is encumbered with many sunken coral heads. A reef, with a depth of one fathom (1^m8) over it, lies half a mile south-eastward of Binugayan point and protects the bay from heavy seas. The best channel into the bay is westward of this reef, and the best anchorage for vessels with local knowledge is in the middle of the bay, in a depth of about 5 fathoms (9^m1), mud, with Bunga point in line with the northern extremity of Apiton island, bearing about 104°.

Binugayan and Lipusan bays lie between Binugayan point and Ludo point, 1¾ miles south-westward; both bays are foul. A line of sunken reefs extends about one mile south-eastward from the point separating the two bays, with a depth of 2½ fathoms (4^m6) at the outer end. Foul ground extends about three-quarters of a mile eastward and half a mile south-eastward from Ludo point.

Oras bay is entered between Ludo point and Bankari point, about 2¼ miles southward. A reef extends about 6½ cables north-eastward from Bankari point. A shoal, with a depth of 2 fathoms (3^m7) over it, lies about 6 cables from the northern shore of the bay. Oras river discharges into the north-western corner of the bay, and on the northern side, half a mile within the entrance, is the town of Oras. There is a buoyed channel into the river for small craft drawing not more than 5 feet (1^m5). There is a small pier near the mouth of the river.

Between Bankari point and Cabra point there are several bays, the entrances to which are encumbered with islets and reefs. Uguis islet, three-quarters of a mile eastward of Bankari point, is wooded and fringed by a reef which extends about 4 cables eastward. Bactol bay, entered about 6½ cables southward of Uguis islet, affords a protected anchorage for small vessels with local knowledge drawing less than 12 feet (3^m7), in a depth of 3 fathoms (5^m5), mud. Bactol island, which lies in the middle of the entrance to Bactol bay, and the reef fringing it protect the anchorage from eastward.

Cabra point (*Lat. 12° 04′ N., Long. 125° 31′ E.*) is steep-to, clear of dangers, and well-defined. A shoal, with a depth of 1¼ fathoms (2^m3) over it, lies about one mile northward of the point, close off the reef extending from the coast of Samar.

Off-lying islands.—A group of islands, comprising Tubabao, 106 feet (32^m3) high, Luctaban, 22 feet (6^m7), Kaybani, Hilaban, Sibay, 80 feet (24^m4), Linao, 106 feet (32^m3), and Fulin, 97 feet (29^m6), and several islets lie on a reef, the northern end of which lies about 3 miles south-south-eastward of Apiton island, and extends 7¾ miles southward. The reef is narrow at the northern end, and gradually widens until it extends over one mile eastward and south-eastward of Fulin, the southern island of this group.

The channel between the 63-foot (19^m2) rock off Apiton island and the pyramidal rock off the northern end of Tubabao island, is about 2½ miles wide, deep, and free from danger, with the exception of a small coral shoal, over which the least depth is 3¼ fathoms (5^m9), lying about 1¼ miles south-south-eastward of Apiton island. The sea breaks heavily on this shoal in bad weather. Westward of the reef on which Tubabao and the other islands lie is a deep passage, 2½ miles wide at the narrowest part.

Charts 943, 1263.

Chart 3808.

Tubabao island, the northernmost of the group just mentioned, is covered with coconut trees. A pyramidal rock, about 30 feet ($9^{m}1$) high, lies close off the north-western extremity and is connected with the island by a drying reef. A village is situated on the western side of the island.

Hilaban island, about 1¾ miles southward of Tubabao, is low and covered with coconut trees, the tops of which are about 55 feet ($16^{m}8$) high. At the southern end is a large village, to which a narrow opening in the reef gives access and affords good shelter for small craft. Three islets lie between Tubabao and Hilaban. Luctaban, the northernmost, is low and covered with trees ; there are bushes on the other two and the highest, close westward of the northern extremity of Hilaban, is 42 feet ($12^{m}7$) high. Kaybani island, about 3 cables eastward of the northern end of Hilaban island, has a ridge over 50 feet ($15^{m}2$) high and is covered with bushes. Sibay, Baohan, Linao and Fulin lie southward of Hilaban island and appear as one on all bearings except from eastward and westward ; they are covered with coconut trees.

Pasig islet is a small sand cay, 6 feet ($1^{m}8$) high, lying 3 miles south-south-westward of Fulin island. The cay lies on the western side of a reef, the greater part of which dries, but on it are a number of scattered boulders which never cover. A wreck lies on the north-eastern edge of the reef, and was reported to be prominent previous to 1941. The channel between Pasig islet and Fulin island is 2 miles wide, clear and deep, with the exception of a small shoal, with a depth of 6½ fathoms ($11^{m}9$) over it near the middle.

Anchorages.—The best anchorage for vessels with local knowledge in the vicinity of these islands during the North-east monsoon is off the middle of the western side of Hilaban island, in a depth of about 10 fathoms ($18^{m}3$), mud. Good anchorage may also be obtained off the western side of Tubabao island, but in greater depths, as the bank is steeper.

Coast.—Between Cabra point (*Lat. 12° 04′ N., Long. 125° 31′ E.*) and the mouth of the Ulut river, about 5 miles south-westward, the coast is low and clear of dangers outside a distance of half a mile ; thence to Tugasan point, 5½ miles farther southward, the land is higher and densely wooded, and the coast is bordered with mangroves.

Dolores river, which discharges about 2½ miles south-westward of Cabra point, has a depth of about 2 feet ($0^{m}6$) on its bar. At high water there is a depth of 7 feet ($2^{m}1$) in a channel marked by stakes, and it is reported that small launches drawing 6 feet ($1^{m}8$) can ascend the river for a distance of 32 miles. The town of Dolores stands on the northern bank of the river just within the bar. Ulut river is fronted by a very shallow bar, which can only be crossed by small boats.

From a position about 1¼ miles southward of the mouth of Ulut river to Tugasan point the coast is much indented and fringed with reefs. A shoal, with a depth of 3 feet ($0^{m}9$) over it, lies about 1¼ miles south-south-eastward of the southern entrance point of Ulut river and three-quarters of a mile offshore. Bakolod islet lies close offshore, about 3½ miles south-south-westward of the southern entrance point of Ulut river. Several detached shoals, the outer of which has a depth of 1¾ fathoms ($3^{m}2$) over it, lie within about 1¼ miles north-eastward of Bakolod islet. Tugasan point, the northern entrance point of Tubig river, is low, and fringed by a reef which extends half a mile east-south-eastward from it.

Charts 943, 1263.

Chart 3808.

Tubig river has a depth of about 6 feet ($1^{m}8$) on its bar, and greater depths inside. The town of Taft stands on the southern entrance point of the river. The usual anchorage for vessels with local knowledge is in a depth of 10 fathoms ($18^{m}3$), mud, with the town bearing 270° and Pindilin point, 2¼ miles south-south-eastward of Tugasan point, 181°; it is frequently untenable during the North-east monsoon, when fairly-protected anchorage may be obtained about 4 cables westward of Makate island, about 2¾ miles south-eastward of Tugasan island, in a depth of 9 fathoms ($16^{m}5$).

Small vessels drawing not more than 12 feet ($3^{m}7$) may obtain good anchorage, in depths of from 3 to 4 fathoms ($5^{m}5$ to $7^{m}3$), south-eastward of the town, about a quarter of a mile north-westward of a small sand cay. A pilot for this anchorage and also for the river can be procured if desired.

Between the entrance to Tubig river and Pindilin point the coast consists of a sandy beach bordered by coconut trees, and is fringed by a reef which extends about 1¾ miles south-eastward from the southern side of the entrance to the river, with a depth of about 4 feet ($1^{m}2$) at its outer end, and about half a mile north-north-eastward from Pindilin point.

Sulat bay and approaches.—Dangers.—Sulat bay, entered between Pindilin point and Taig point, 3¼ miles south-south-eastward, is shallow at its head. It is fronted by Makate, Macalayo, Catalaban (Katalaban), and Anajao islands, all of which are fringed by reefs with narrow boat channels between them, and also between them and the adjacent coast.

Makate island (*Lat. 11° 53′ N., Long. 125° 28′ E.*) is low, covered with coconut trees, and bordered with mangroves. It is fringed by a reef which extends 6½ cables north-eastward. A rocky patch, with a depth of 3¼ fathoms ($5^{m}9$) over it, lies about 1¼ miles north-eastward of the island, and breaks heavily in bad weather. There is a deep channel between this patch and the reef extending north-eastward from Makate island about half a mile wide.

Macalayo island, 84 feet ($25^{m}6$) high, and wooded, lies about 6 cables south-westward of Makate island.

Catalaban island, the largest of the group fronting Sulat bay, is 104 feet ($31^{m}7$) high, with a low isthmus in the middle of the island, covered with coconut trees. San Vicente village stands on the southern side of the island. The island is fringed by a reef which extends 4 cables from the eastern end and about 2 cables from the north-eastern side.

A rock, awash, lies about a quarter of a mile south-south-eastward of the south-eastern point of Catalaban island; it is steep-to on its southern side, and marks the northern side of the channel into Sulat bay.

Anajao island, half a mile southward of the western end of Catalaban island, is low and covered with coconut trees.

Taig point is bordered by coconut trees and mangroves, and is fringed by a reef which dries extending 1¼ miles north-eastward, and on which are four rocky islets; Agauan, the outer islet, is 16 feet ($4^{m}9$) high. A detached coral patch, with a depth of 3 feet ($0^{m}9$) over it, lies about three-quarters of a mile northward of Taig point and close off the western edge of the reef extending from that point; this is the only detached danger in Sulat bay.

Charts 943, 1263.

Chart 3808.

The town of Sulat is situated on the eastern side of the entrance to Sulat river, which discharges about half a mile south-westward of Taig point. The stone walls of a large ruined church, within which is a nipa edifice, is the most prominent building in the town.

Anchorage.—Anchorage may be obtained by vessels with local knowledge, in a depth of 5 fathoms (9^{m}1), mud, with the ruined church at Sulat bearing 195°, and about three-quarters of a mile northward of Taig point. Inside this position the depths decrease rapidly. A heavy sea often sets into the bay during the North-east monsoon, and during that period better anchorage may be obtained off San Vicente village, on the southern side of Catalaban island.

Coast.—Paninihian point is the eastern extremity of the broad projection of the coast separating Sulat bay from Port Libas, about 3 miles southward. The reef extending from Taig point continues southward and fringes Paninihian point and Cannomanda point, the northern entrance point of Port Libas, extending as much as a quarter of a mile offshore ; it has many large boulders on it and is steep-to.

Chart 1622, plan of Port Libas.

Port Libas.—Port Libas is entered between Cannomanda (Kannomanda) point and Najibil (Nahibil) point, 9 cables southward, but the navigable channel between the reefs which fringe both points is only 3½ cables wide. The shores of the bay are indented by five bights, all of which are shallow. The points separating these bights are fringed by reefs which dry, and in the southern part of the port there are several detached rocks above water with mangroves growing on them.

Palan point lies 5½ cables westward of Najibil point (*Lat. 11° 46′ N., Long. 125° 28′ E.*), and close southward of Palan point is San Julian, the principal town in the port. Remedios village is situated at the head of the bight on the northern side of the port entered about one mile westward of Cannomanda point. Magnana point, 1¼ miles westward of Palan point, and on the southern side of the port, is easily identified. About half a mile south-westward of it are some steep conical hills, the highest of which is Mount Magnagua, having an elevation of 285 feet (86^{m}9). Tubigan point lies on the northern side of the port, 5½ cables northward of Magnana point.

Anchorages.—Directions.—Anchorage may be obtained, in a depth of about 5 fathoms (9^{m}1), about 4 cables eastward of Tubigan point. Small vessels may proceed farther in and anchor between Magnana and Tubigan points, in a depth of about 2½ fathoms (4^{m}6), sand.

A vessel entering Port Libas should, from a position about one mile offshore, steer with Mount Magnagua in line with the depression between the horns of a saddle-shaped mountain in the interior, bearing 250°, which will lead midway between the reef extending southward from Cannomanda point and the foul ground on the southern side of the entrance. When San Julian begins to open westward of Palan point, the vessel should steer for Tubigan point, which will lead to the anchorage.

Chart 3808.

Coast.—Between Najibil point and Anitaguipan point, 5½ miles south-south-eastward, the coast is low, covered with coconut trees, and fringed with mangroves. The coastal reef which fringes Najibil point continues southward with several breaks nearly to Anitaguipan point. The small bays on this part of the coast are encumbered by

Chart 3808.

reefs and are of little use to shipping. Anitaguipan point is a bold, rocky, steep-to headland, 282 feet (85^{m}9) high, and well wooded. About three-quarters of a mile south-westward of it is Capinas point, from which a reef extends about 4 cables south-eastward.

Napla bay, entered between Capinas point and Amogotada point, the north-eastern extremity of Andis island, about one mile southward, affords good anchorage for vessels with local knowledge, except during the North-east monsoon, when a heavy sea often sets in. There are several villages on the shores of the bay. Amogotada point is a bold rocky headland, about 100 feet (30^{m}5) high.

Chart 1622, plan of Port Borongan.

Port Borongan.—Lights.—Dangers.—Port Borongan is entered between the southern extremity of Andis island and the northern side of Divinubo island, 1¾ miles south-south-eastward.

A coral reef extends as much as 2 cables from the eastern side of Andis island. The north-western point is low and sandy, and a narrow reef, which dries, fringes the western side of the island. There is a narrow boat channel between the north-western point and the reefs extending from Samar.

A rocky shoal, with a depth of 2½ fathoms (4^{m}6) over it, on which the sea breaks in heavy weather, lies about 2¼ cables south-westward of the southern point of Andis island, and a steep-to rocky shoal, awash, lies about 1¼ miles west-south-westward of the same point ; it is marked by breakers when there is any sea.

Divinubo island appears almost flat, and its northern and eastern sides are fringed by a reef which extends 2 cables offshore. A 2½-fathom (4^{m}6) patch lies 4 cables north-eastward of the south-eastern extremity of the island and about 2¾ cables offshore. The island is almost connected with Lalawigan (Lalauigan) point, about 1½ miles westward of it, by reefs which dry, on which are the Coco islets and some large boulders.

A light (*Lat. 11° 36′ N., Long. 125° 30′ E.*) is exhibited, at an elevation of 136 feet (41^{m}4), from a white framework structure on a house on the summit of Divinubo island.

At the head of the port there is a point projecting eastward, from the end of which a reef, which dries, extends about half a mile east-north-eastward, and divides the head of the port into two bays, only the northern of which is used. Loom (Oom) river discharges just northward of this point, and Borongan river into the north-western part of the northern bay. About half a mile eastward of the mouth of this river there is a low bushy islet lying on the middle of a reef. Between the mouths of the two rivers there is a sandy beach bordered by coconut trees.

Borongan, the principal town on the east coast of Samar, is situated on the northern bank near the mouth of Loom river ; it is obscured from seaward by coconut trees.

A light is exhibited, at an elevation of 29 feet (8^{m}8), from a white concrete tower, about three-quarters of a mile south-south-westward of the southern entrance point of Borongan river.

There is a concrete pier about half a mile eastward of the southern entrance point of Loom river ; in 1938, it had a depth of 21 feet (6^{m}4) at its head ; it is protected by a breakwater close eastward. There is a hospital and post and telegraph office at Borongan.

Charts 943, 1263.

Chart 1622, plan of Port Borongan.

Anchorages.—Directions.—The best anchorage during the North-east monsoon is westward of the northern part of Andis island. It is reported, however, that this anchorage does not afford protection during typhoons, on account of the heavy seas making around the southern end of the island.

The usual anchorage is south-westward of the bushy islet eastward of the mouth of the Borongan river, where there is some protection from the easterly swell.

To enter Port Borongan, vessels should steer for the light-structure south-westward of the mouth of Borongan river, bearing 270°, and anchor in a depth of about 9 fathoms ($16^{m}5$), about one mile offshore, this anchorage is, however, untenable during the North-east monsoon.

If proceeding to the northern anchorage, the vessel should round the southern end of Andis island at a distance of half a mile, then alter course north-westward, and anchor in depths of from 10 to 12 fathoms ($18^{m}3$ to $21^{m}9$), mud, about 3 cables from the western side of the island, with Anitaguipan point, bearing about 031°, just open north-westward of the north-western point of Andis island.

Charts 3808, 3810.

Coast.—The coast for 4 miles southward of Lalawigan point is bordered by a sandy beach, interspersed by rocky bluffs, thence for about 2 miles south-eastward, abreast the Maiduun islets there are sandy beaches separated by rocky points fringed with coral reefs; thence for 2 miles south-south-eastward, abreast Minasangan island, the coast is low and fringed by a reef.

Soribao river, with a depth of about 2 feet ($0^{m}6$) on its bar, and a greater depth inside, discharges about 3 miles southward of Lalawigan point. It is about 1¼ cables wide just inside its mouth, and is separated from the sea by a low sandy point extending from the bluff on the northern side to within a short distance of the rocky bluff on the southern side, confining the river to a narrow channel. Soribao (Suribao) village (*Lat. 11° 33′ N., Long. 125° 28′ E.*) is situated on the northern side of the river just inside the sandy point at the entrance.

Maiduun islets are two wooded islets, lying on the wide reef extending from the coast of Samar; this reef dries for a distance of half a mile north-north-eastward of the islets, thence turns northward for about a quarter of a mile and thence continues as a sunken reef for about 4 cables farther; it should be given a wide berth.

Maydolong village is situated on the southern side of Maydolong cove, about half a mile westward of Maiduun islets. Small vessels with local knowledge may obtain anchorage in the cove, which is formed between the coastal reef and some detached reefs lying eastward of it.

Minasangan island, 64 feet ($19^{m}5$) high, lies on the coastal reef, which extends about 6 cables offshore. The island and the adjacent coast are covered with coconut trees. The eastern extremity of the island is a steep-to shelving rock, on which the sea breaks heavily even in moderate weather. The southern side of the island is steep-to.

Cabay (Kabay) bay is entered southward of Minasangan island, and is about 1¼ miles wide at its entrance. The shores are fringed by reefs and there are several shoals, with depths of from 1¾ to 2½ fathoms ($3^{m}2$ to $4^{m}6$) over them, lying within 2¾ cables of the southern shore, but there is ample anchorage space available for vessels with local

Charts 943, 1263.

Charts 3808, 3810.

knowledge ; it is, however, exposed to north-easterly winds. Cabay (Kabay) village stands at the head of the bay.

Between the southern entrance point of Cabay bay and Tugnug point, 8¾ miles south-eastward, the coast is indented by several bays, is fringed by coral reefs, and fronted by several islands.

Minanut island lies about 3½ cables eastward of San Miguel point, situated about 1½ miles south-eastward of the southern entrance point of Cabay bay. The northern point of the island is steep-to, but the rest of the island is fringed by a reef. The northern and north-eastern sides are faced by vertical cliffs, about 100 feet ($30^{m}5$) high ; the south-western point is low and sandy, but within it the land rises to a ridge densely covered with coconut trees.

Minanut anchorage.—Directions.—Minanut anchorage is a cove, lying southward of San Miguel point ; Minanut island, lying in the entrance, protects it from north-easterly winds. The anchorage is not recommended during the typhoon season nor in strong North-east monsoon weather, as the breakers on the reefs at the northern entrance induce strong currents, which cause a vessel to sheer about. The northern entrance is not recommended, as it is encumbered by reefs, leaving only a narrow but deep channel between them.

To approach the anchorage from southward a vessel should pass about 3 cables southward of Minanut island, looking out for the reefs on either side, and as soon as San Miguel point opens westward of Minanut, she should alter course northward and anchor in the middle of the cove, in a depth of 9 or 10 fathoms ($16^{m}5$ or $18^{m}3$), mud, with San Miguel point bearing 350°, and the south-eastern point of Minanut island, bearing about 086°, open southward of the south-western point. There is a good boat landing in a break in the reef on the south-western side of the cove.

Lanang river discharges about 1¼ miles southward of San Miguel point, on the southern side of a rocky point fringed with mangroves, from which a reef extends 1¼ cables eastward. The southern entrance point is low and sandy, and from here the coast for one mile south-south-eastward, is bordered by a sandy beach ; thence to a rocky point three-quarters of a mile eastward, the coast is fringed by a reef.

The town of Llorente (*Lat. 11° 25′ N., Long. 125° 33′ E.*) stands on a low grassy flat on the southern side of the entrance to Lanang river. The ruins of a church and some buildings are visible from seaward, and a tall flagstaff is the most prominent object. Coasting steamers call occasionally. The usual anchorage for vessels with local knowledge is, in a depth of 10 fathoms ($18^{m}3$), about half a mile eastward of the mouth of Lanang river ; small vessels can anchor closer to the town, in a depth of 7 fathoms ($12^{m}8$). These anchorages are sometimes untenable during the North-east monsoon.

Iniyao islet, 90 feet ($27^{m}4$) high, lies half a mile eastward of the rocky point south-eastward of Llorente, and is connected to the coast southward by a drying reef. Between the rocky point and the islet there is the entrance to a bay which extends about one mile south-westward, and the shores of which are fringed with coral.

Between the point southward of Iniyao islet and Tugnug point, the coast consists of rocky cliffs, from 40 to 90 feet ($12^{m}2$ to $27^{m}4$) high, and is fringed by reefs which extend as much as a quarter of a mile offshore and fill up the few indentations in the coast between

Charts 943, 1263.

Charts 3808, 3810.

these points. At Tugnug point there is no fringing reef. The cliffs are nearly vertical, with the tops covered with small trees and bushes; a short distance inland the land rises to an elevation of from 300 to 500 feet ($91^{m}4$ to $152^{m}4$), and is densely wooded.

Just southward of Tugnug point is a small cove with considerable depths; its head is filled with coral; here the coast, for nearly one mile southward to Agdan point, consists of perpendicular, steep-to cliffs, from 25 to 50 feet ($7^{m}6$ to $15^{m}2$) high. This bluff headland is prominent when seen from northward or southward, as it rises to an elevation of 200 feet ($61^{m}0$) to the tops of the trees at a short distance from the cliffs.

Nagaha bay, entered on the south-western side of Agdan point, is about half a mile wide at the entrance; its shores are mostly low, and fringed with coral. In the north-eastern corner of the bay is a small beach, bordered by a coconut grove, where landing could probably be made at any time.

Anchorage may be obtained by vessels with local knowledge, in a depth of 16 fathoms ($29^{m}3$), in the middle of Nagaha bay, about a quarter of a mile south-westward of Agdan point.

Panadlihan point, the south-western entrance point of Nagaha bay, is the termination of a small thinly wooded peninsula faced by cliffs, from 30 to 40 feet ($9^{m}1$ to $12^{m}2$) high. Between this point and Bura point, about 1¾ miles south-south-westward, there is a bay entirely filled with a drying coral reef, except for a small break half a mile north-eastward of Bura point, leading to the mouth of Hernani river. The shores of the bay are low and the land within rises gradually to the foothills of the high wooded range in the interior. Bura point is low and wooded, and terminates in a line of black rocks, from 20 to 30 feet ($6^{m}1$ to $9^{m}1$) high; there are no sunken rocks outside them. The village of Hernani is situated about half a mile westward of Panadlihan point.

Chart 3826.

Pambuhan harbour. — Dangers. — Buoy. — Pambuhan harbour, entered between Bura point and Matarinao point (*Lat. 11° 14′ N., Long. 125° 35′ E.*), 4¾ miles south-south-westward, is the largest, best protected and most accessible harbour on the east coast of Samar. Both sides of the entrance are formed by broad reefs, leaving a deep narrow channel between them which leads to the various anchorages in the bay. The reefs, which partly dry, are usually marked by breakers, and are readily discernible at all times. There are numerous fish traps in the harbour.

A chain of islands lies on a reef, which dries, extending about 2¼ miles south-south-westward from San Miguel village, situated on the northern shore about 2 miles south-westward of Bura point. The northernmost island is Masisingi, 178 feet ($54^{m}2$) high, 1½ cables southward of which is Lalauigan, 266 feet ($81^{m}1$) high. Capocpocanan lies about 3½ cables south-westward of Lalauigan. Anahao island, about 3 cables farther south-westward, is low, covered with mangroves, and fringed by a reef on its eastern side, which extends from about half a cable to 1½ cables offshore.

Other prominent islets on the south-eastern side of the fairway in the approach to the anchorage of Pambuhan Sur are:—Linoa islet, 81 feet ($24^{m}7$) high, and densely wooded, about 4 cables north-westward of Matarinao point. Kanadag islet, about 3 cables westward of the

Charts 943, 1263.

Chart 3826.

same point, is low and flat, with a sandy beach, and is covered with brushwood and some coconut trees. Pou rock, a small black rock, 12 feet (3^m7) high, lies on a sand cay, which dries about 5 feet (1^m5), situated half a mile westward of Linoa islet. Minaloa islet, one mile westward of Kanadag islet, is the highest of the group on this side of the fairway, having an elevation of 143 feet (43^m6), with a rounded wooded summit, and a low extension southward, on which is a clump of coconut trees. Minadion islet, 8 cables west-south-westward of Minaloa islet, is low, rocky and covered with dark trees, which show up well against the mangroves on the shore behind it.

The southern part of the harbour, known as Matarinao bay, is encumbered with dangers, some of which dry.

A shoal, with a depth of 4 fathoms (7^m3) over it, lies in the fairway of the approach to the anchorage off Pambuhan Sur, 4¼ cables south-eastward of the southern extremity of Anahao island (*Lat. 11° 15′ N., Long. 125° 33′ E.*).

There are several villages on the shores of the bay, Pambuhan Sur, situated westward of the southern end of Anahao island, being the only one of any importance ; it is connected to the telegraph system.

There is a loading pier, with a least depth of 23 feet (7^m0) at its head, at Pambuhan Sur. A mooring buoy is situated about 2 cables south-eastward of the head of the pier. Vessels can lie alongside the pier.

Anchorages.—Directions.—The usual anchorage for large vessels with local knowledge is in a depth of 7 fathoms (12^m8), mud, about 3 cables south-westward of the southern end of Anahao island. Small vessels can anchor farther northward, in depths of not less than 5 fathoms (9^m1), as the reefs are very steep-to. This anchorage is well protected, but better shelter may be obtained during typhoon weather about 3½ cables westward of Kanadag islet.

A vessel with local knowledge bound for the anchorage off Pambuhan Sur should, from a position well outside the reefs, steer for Minaloa islet, bearing 218°, until Kanadag islet is well open westward of Linoa islet, with the southern extremity of Anahao island, bearing 257°, when she should steer about 249°, passing about 1¼ cables northward of the 4-fathom (7^m3) shoal. When Minaloa islet is abeam she may steer for the pier or for the anchorage eastward of it.

Coast.—Dangers.—Between Matarinao point and Agojo point, about 16 miles south-eastward, the coast forms the eastern side of a narrow peninsula between the Pacific ocean and the shallow bay westward of its south-eastern end. A chain of islands, comprising Calicoan (Kalikoan), Leleboon, and Candolu (Kandolu), lies on a reef extending about 8 miles south-eastward, forming a prolongation of this peninsula. Calicoan (Kalikoan) pass, the passage between the peninsula and the north-western end of Calicoan island, and the passages between the islands, are narrow and shallow, and dry in places.

The most remarkable feature of this stretch of coast is a bold coral ridge, about 400 feet (121^m9) high in places, which extends from Matarinao point to Sungi point, the southern extremity of Candolu island. At several places it is broken by steep gaps, and at one place it disappears for over one mile, but the general impression is one of uniform elevation, with vertical sea faces, over 300 feet (91^m4) high, usually covered with bushes, but sometimes entirely bare. The ridge is from 1½ to 3¼ cables wide, and it slopes gradually westward ; there

Charts 3808, 3810, 943, 1263.

is a belt of low level land between the ridge and the sea. The coast consists of high sand beaches and coral bluffs alternately, the latter about 20 feet (6^{m}1) high.

Asgad and Pananamitan points lie about 5 and 7 miles, respectively, south-eastward of Matarinao point. Hagnaya and Bagtong points, one and 5 miles, respectively, south-eastward of Pananamitan point, are not distinguishable from seaward, being merely bluffs, from 20 to 30 feet (6^{m}1 to 9^{m}1) high. From close north-westward of Asgad point to Hagnaya point the cliffs are vertical, mostly bare and very prominent. The ridge southward of Hagnaya point is broken up into densely wooded hills; the most noticeable bluff in this ridge is abreast Bagtong point, where it is practically vertical and 408 feet (124^{m}4) high. From abreast this point to abreast Luyong point, 2 miles south-eastward, the ridge is one vertical wall of coral rock, with a few bushes on it.

From Matarinao point (*Lat. 11° 14′ N., Long. 125° 35′ E.*) to Luyong point the coast is fringed by a reef, which, over the greater part, extends about 1¼ cables offshore; thence to Calicoan pass, it extends about 4 cables.

Calicoan island has a ridge of hills, similar to those on the peninsula, from 250 to 350 feet (76^{m}2 to 106^{m}7) high. The bluff facing Calicoan pass is nearly vertical, but changes into moderate slopes farther south-eastward. For about 3½ miles south-eastward of the northern extremity of the island there is no fringing reef, the coast being formed of coral rock, about 20 feet (6^{m}1) high. Thence, except for a break of about one mile, a fringing reef extends along the remaining coasts of this island, and the eastern coasts of Leleboon and Candolu islands, gradually widening to half a mile, continuing round Sungi point. There are several villages on the west coast of Calicoan island.

Leleboon island is 200 feet (61^{m}0) high. Salanga village is situated on the western side.

Candolu island is 188 feet (57^{m}3) high in the northern part, and well wooded. Sungi point is about 150 feet (45^{m}7) high and fringed by a reef which extends about half a mile from its eastern side. Patches of reef lie within the same distance southward and westward of the point. Two shoals, with a least depth of 13 feet (4^{m}0) over them, lie one mile south-south-eastward and 8 cables south-south-westward, respectively, of the same point. A shoal, with a depth of 16 feet (4^{m}9) over it, and a shoal, with a depth of 18 feet (5^{m}5), lie 9 cables south-eastward and 8 cables southward, respectively, of the same point.

SOUTHERN SIDE OF SAMAR.—Coast.—Buoyage.—Between Sungi point and Gigoso point, about 22 miles north-westward, the coast is fronted by many islands and reefs to a distance of as much as 5½ miles. The reefs, some of which dry, are very extensive in places and have between them deep channels, in which good anchorage, protected from the sea, may be obtained by vessels with local knowledge. The channel between Sungi point and Handig point, the northern extremity of Homonhon island (page 584), 10 miles south-westward, is deep and clear of dangers in the fairway; the water is clear and the bottom may frequently be seen; tide-rips occur in the north-eastern part of the channel.

Manicani (Manikani) island, 534 feet (162^{m}8) high, lies about 11½ miles west-north-westward of Sungi point. It is fringed by a reef which

Charts 3808, 3810, 943, 1263.

Chart 3826.

extends less than half a mile offshore, except on the northern side, where it extends over 5 miles north-westward, with Baul islet near its north-western end, and Binabasalan islet on a detached reef about 1¼ miles north-eastward of it.

Guiuan is a small town with a prominent church, situated at the south-eastern end of Samar, about 2 miles north-westward of Agojo point. Vessels with local knowledge may obtain anchorage off the town, well sheltered from southerly and south-westerly seas, but exposed to winds from these directions. A causeway leads over the reefs in front of the town ; a detached coral reef, which dries, lies close off the outer end.

Salcedo village is situated 8 miles north-north-westward of Guiuan ; the approach to it is narrow and intricate.

Quinapundan (Kinapundan) bay, entered between Gigoso point and Balinatio island, 3½ miles east-north-eastward, is encumbered with numerous islets and reefs, among which good protected anchorages may be obtained by vessels with local knowledge. Balinatio island lies on the coastal reef extending 1¼ miles southward from Cabarasan (Kabarasan) point. Gigoso point (*Lat. 11° 05′ N., Long. 125° 31′ E.*) is low, but the land about three-quarters of a mile within rises to an elevation of 400 feet ($121^{m}9$).

Guiuan may be approached by two straight channels marked by beacons and buoys, which meet about 1½ miles southward of the town, whence to the anchorage the channel is narrow and tortuous. The south-western channel is marked at its entrance by a light-buoy, painted in black and white vertical stripes, exhibiting a *white* light with ***alternate short and long flashes***, moored about 9 cables south-south-eastward of the southern extremity of Manicani island. In 1949, several buoys and all the light-buoys marking both channels were reported missing. The middle of the channel is on the alignment of the church spire at Guiuan and some piles about one mile south-westward, bearing 048°, which leads a vessel to within about 2½ miles of Guiuan, whence there is a tortuous channel to the anchorage.

Anchorage may also be obtained by a vessel with local knowledge, in depths of from 12 to 14 fathoms ($21^{m}9$ to $25^{m}6$), off the north-eastern side of Cabalarian (Kabalarian) islet, situated 2½ miles northward of Manicani island. A vessel proceeding to this anchorage should keep on the alignment of the church spire and piles, bearing 048°, for about 3 miles from the entrance and then alter course north-westward, passing north-eastward of Cambasingan islet, situated about 1½ miles northward of the north-eastern extremity of Manicani island, thence south-westward of Caninoan islet, three-quarters of a mile northward of Cambasingan islet, and thence to the anchorage.

Off-lying shoal.—Walker shoal, with a least depth of 2 feet ($0^{m}6$) over it, lies about 4 miles south-south-eastward of Gigoso point. It can be discerned by the light green colour of the water.

Coast.—Dangers.—Buoy.—Between Gigoso point and Capines point, 16½ miles westward, the coast is indented by several bays, in which there are steep-to rocks and shoals. There are several villages on this coast, which is wooded.

Detached shoals, with depths of from 21 to 39 feet ($6^{m}4$ to $11^{m}9$) over them, lie within 1¼ miles south-westward of Gigoso point. Sua bay is entered between Cagbanlio (Kagbanlio) point, situated 2 miles

Charts 3808, 3810, 943, 1263.

Chart 3826.

north-westward of Gigoso point, and Sua point, about 1¾ miles westward of Cagbanlio point. A bank, with a depth of 19 feet ($5^{m}8$) at its outer end, extends about three-quarters of a mile southward from Cagbanlio point. A detached shoal, with a least depth of 13 feet ($4^{m}0$) over it, lies one mile southward of Sua point.

About 3 miles south-westward of Sua point is Cablagna (Kablagna) point, which is low and wooded. A coral reef, nearly awash, lies 8 cables southward of Cablagna point, and a shoal, with a least depth of one fathom ($1^{m}8$) over it, lies three-quarters of a mile westward of the same point. Lucson (Lukson) point, 2¼ miles north-westward of Cablagna point, is 400 feet ($121^{m}9$) high and Lauaan point, about 3½ miles west-north-westward of Lucson point, is low; Maglolobo bay lies between these two points. Calianan (Kalianan) shoal, with some rocks awash near its outer end, extends about 2 miles southward from Lauaan point.

Lauaan bay is entered between Lauaan point and Capines point (*Lat. 11° 05′ N., Long. 125° 14′ E.*). Lauaan islet, 15 feet ($4^{m}6$) high, lies about 3 cables from the eastern shore of the bay and about one mile north-westward of Lauaan point. A spit, with a depth of 13 feet ($4^{m}0$) at its outer end, extends about half a mile southward from the islet. About one mile north-westward of Lauaan islet, and about 4 cables from the northern shore is Aporoo islet. A spit, with a depth of 3 fathoms ($5^{m}5$) at its outer end, extends about 4½ cables southward from the islet. A bank, with a least depth of about 4 feet ($1^{m}2$) over it, extends nearly one mile eastward from the western shore about 2½ miles northward of Capines point; it is marked at its outer end by a black can buoy, No. 1.

There is a signal tower at the head of Lauaan bay, about 3¼ miles west-north-westward of Lauaan point. This tower, in line with a dolphin situated about 2½ cables south-south-eastward of it, bearing 344°, leads about 1½ cables eastward of black can buoy No. 1. This alignment leads between several other buoys. The village of Lauaan is situated in the north-eastern corner of the bay.

Capines point is steep-to and clear of dangers; the land within rises to an elevation of 500 feet ($152^{m}4$), about three-quarters of a mile northward of its extremity.

Off-lying shoals.—Buoy.—Two shoals, each with a depth of 5 fathoms ($9^{m}1$) over it, lie from 3½ to 4 miles southward of Capines point; the outer shoal is marked on its eastern side by a black can buoy, No. 1. A shoal, with a least depth of 5 fathoms ($9^{m}1$) over it, lies about 3 miles south-westward of the same point.

San Pedro bay.—Beacon.—San Pedro bay, formed between the south-western coast of Samar and the eastern coast of Leyte, is 11¾ miles wide at its entrance between Capines point and Vigia point westward of it. The bay is encumbered with numerous islets, reefs, and shoals. The towns of Tanauan and Palo are situated on the western side, about 3 and 6½ miles, respectively, north-north-westward of Vigia point, and Tacloban, the capital of Leyte, in the north-western part. Basey (Basei), in which there is a prominent church, stands on the northern shore. The eastern shore is sparsely populated. San Joaquin and Palo rivers discharge about 5½ and 6 miles, respectively, northward of Vigia point, and Basey (Basei) river into the head of the bay.

Mantuaka (Mantuaca) point, which is steep-to, lies about 1¾ miles

Charts 3808, 3810, 943, 1263.

Chart 3826.

north-westward of Capines point, with Alabat point midway between. A white beacon, lettered G, stands on Mantuaca point.

Vigia point is a rocky headland, 384 feet ($117^{m}0$) high, and shows as a pyramid from southward; there is an old fort on its summit.

Islets and dangers. — Lights. — Beacons. — Buoyage. — An obstruction was reported, in 1946, about 2¾ miles south-westward of Capines point. Mariquitdaquit (Marikitdakit) islet, lying about 5 miles westward of Capines point, is a flat rock, about one foot ($0^{m}3$) high, on which are two rocky lumps, about 18 feet ($5^{m}5$) high.

· A light is exhibited, at an elevation of 60 feet ($18^{m}3$), from a white concrete pillar on Mariquitdaquit islet (*Lat. 11° 04′ N., Long. 125° 09′ E.*). A 2-fathom ($3^{m}7$) patch was reported, in 1901, by s.s. *Juno* to lie about half a mile westward of the islet; its existence is doubtful.

A shoal, with a least depth of 25 feet ($7^{m}6$) over it, lies about 5½ cables south-south-eastward of Mariquitdaquit islet, and a bank, with a depth of 19 feet ($5^{m}8$) at its outer end, extends 7 cables south-south-westward from the same islet. Two shoals, with depths of 27 and 25 feet ($8^{m}2$ and $7^{m}6$) over them, lie about 1¼ and 1½ miles, respectively, south-westward of the islet, and two shoals, with depths of 27 and 29 feet ($8^{m}2$ and $8^{m}8$) over them, lie about 3 miles west-south-westward and 2½ miles westward, respectively, of the same islet.

For other shoals southward of a line joining Mariquitdaquit islet and Vigia point, *see* page 583.

Several shoals, with depths of from 6 to 7 fathoms ($11^{m}0$ to $12^{m}8$) over them, lie within 6 cables north-eastward, northward and north-westward of Mariquitdaquit islet. Several shoals, with depths of 6 and 6½ fathoms ($11^{m}0$ and $11^{m}9$) over them, lie from about 1½ to 2¼ miles eastward of Vigia point.

Raso and Badungbadung islets, 100 and 130 feet ($30^{m}5$ and $39^{m}6$) high, respectively, lie within one mile of the eastern shore of the bay, about 2 miles north-north-westward of Mantuaca point.

Camoropudan (Kamoropudan) islets are a group of seven islets, from 55 to 150 feet ($16^{m}8$ to $45^{m}7$) high, lying within 6 cables of the eastern shore, about 3½ miles northward of Raso islet.

Iris shoal, with a depth of 14 feet ($4^{m}3$) over it, lies near the middle of the bay, about 4 miles westward of Camoropudan islets.

Chart 3840.

Egbert shoals are two rocky patches, with depths of 12 and 15 feet ($3^{m}7$ and $4^{m}6$) over them, respectively, lying 8½ cables apart, the south-western patch being about 6 miles north-north-eastward of Vigia point. A conical light-buoy, No. 12, painted red, exhibiting a *white flashing* light *every five seconds*, is moored close westward of the south-western patch. In 1950, it was reported to be missing.

Palo reef is a rocky patch, with a depth of about one foot ($0^{m}3$) over it, lying about 1½ miles eastward of the mouth of Palo river. A can buoy, painted in red and black horizontal bands, is moored close south-eastward of the reef. It was reported to be missing in 1948.

Dio islet, low and wooded, lies 1¾ miles south-eastward of Cataisan (Kataisan) point, situated about 10½ miles northward of Vigia point. A white beacon, lettered C, is situated on the northern extremity of the islet.

Chart 3826.

Punubulu islet, about 3¾ miles eastward of Dio islet, is low and

Chart 3826.

wooded. Foul ground, with rocks awash, extend about one mile south-south-eastward from Punubulu islet, and several shoals, some of which are marked by buoys, painted in red and black bands, and the positions of which may best be seen on the chart, lie between the latter islet and the coast of Samar.

Chart 3840.

Jinamoc (Hinamok) island, 60 feet (18^{m}3) high, and wooded, lies 6½ cables from the northern shore southward of Basey. It lies on the shore bank which extends 2 miles south-south-eastward of the island, and on which are two patches which dry one foot (0^{m}3). The southern patch is marked on its southern side by a can buoy, painted in red and black bands.

A light is exhibited, at an elevation of 78 feet (23^{m}8), from a white concrete pillar, on the south-western side of Jinamoc island (*Lat. 11° 16′ N., Long. 125° 05′ E.*).

Charts 3840, 3826.

Recommended track. — Dangers. — Buoyage. — The recommended track from the entrance to San Pedro bay to a position about 2½ miles eastward of Tacloban is indicated on charts 3826 and 3840 by pecked lines. The southern side of the track is marked at its outer end, situated about 1½ miles south-south-westward of Capines point, by a can light-buoy, No. 3, exhibiting a *white flashing* light *every four seconds*, thence by can buoys Nos. 7 and 9, situated about 6 and 9¾ miles west-north-westward, respectively, of the same point; the latter buoy is moored on the northern side of a 27-foot (8^{m}2) patch.

The northern side of this track is marked by red conical buoys, Nos. 6 and 8, situated about 4½ and 6¾ miles west-north-westward, respectively, of Mantuaca point; the latter buoy is moored about a quarter of a mile southward of a 20-foot (6^{m}1) patch. A conical light-buoy, No. 10, painted red, exhibiting a *white flashing* light *every second*, is moored on the northern side of the track, about 1¼ miles west-north-westward of No. 8 buoy. Thence the track turns northward, passing westward of light-buoy, No. 12, marking the south-western patch of Egbert shoals.

There are numerous shoals besides those mentioned above, on both sides of the recommended track; their positions may best be seen on the chart.

Chart 3840.

Approaches to Tacloban.—Dangers.—Buoyage.—Beacons.— A white beacon, lettered B, is situated on the western side of the bay, about 4½ miles northward of Camiris (Kamiris) point, situated about 3½ miles north-north-westward of Vigia point.

Cancabato (Kankabato) bay, entered between Cataisan point and Panirugan point, about 1¾ miles north-westward, is shallow. The town of San Ricardo stands at the head of the bay.

A bank, with a least depth of one foot (0^{m}3) over it, and 18 feet (5^{m}5) at its outer end, extends about 3½ miles eastward from Panirugan point; its northern edge forms the southern side of the channel leading to Tacloban and the southern entrance to San Juanico strait. There is a narrow channel, with a depth of 9 feet (2^{m}7) in it, marked by two red conical buoys and two black can buoys, between this bank and Cataisan and Panirugan points, but the main channel in and out of Tacloban is eastward and northward of the bank. In 1949, there was

Charts 3823, 3808, 3810, 943, 1263.

Chart 3840.

a narrow dredged channel, continued from the northern end of the recommended track described above, with a least depth of 17 feet (5^m2), passing eastward and north-eastward of the eastern extremity of the bank, as indicated by dotted lines on the chart.

A conical light-buoy, No. 2, painted red, exhibiting a ***white flashing*** light ***every four seconds***, moored about 3 miles south-south-westward of Jinamoc island lighthouse, marks the eastern side of the entrance to the dredged channel. It was reported to be missing in 1950.

Two pairs of leading beacons, the first close westward of and the second about 1½ miles north-westward of Tingib point, the north-western extremity of Jinamoc island, lead through the dredged channel.

The front beacon, in each case, consists of a white square with a vertical orange stripe and the rear beacon, in each case, consists of a white diamond with a vertical orange stripe.

The first pair of beacons are in line, bearing about 004° and the second pair are in line, bearing about 327°.

The western side of the dredged channel is marked by three black can buoys, Nos. 3, 5 and 7; the northern edge of the shoal is marked by six can buoys, Nos. 9, 11, 13, 15, 17 and 19. The positions of these buoys can best be seen on the chart. All these buoys, except No. 3, were reported to be missing in 1950.

A red conical buoy marks the edge of the 3-fathom (5^m5) bank, 5½ cables south-westward of Jinamoc island light-structure.

A spit, with depths of 3 fathoms (5^m5), or less, over it and a least depth of 4 feet (1^m2) near its southern end, extends about 9 cables southward from Catinic (Katinik) point (*Lat. 11° 17′ N., Long. 125° 02′ E.*), on the northern shore about 2 miles north-eastward of Panirugan point; the southern edge of this spit is marked by a red conical buoy, No. 16.

Pilots.—Pilotage is compulsory for merchant vessels of 60 tons, gross register and above, in and out of Tacloban and through Janabatas channel. Vessels requiring a pilot should give 24 hours' notice by radio. Vessels from southward will be met at Mariquitdaquit islet or off Dio islet; vessels from northward may obtain a pilot from the station on Canauay island, at the northern entrance to Janabatas channel. If bound for Tacloban wharf, vessels should anchor off Egbert shoal and await the pilot.

Anchorage.—Buoy.—Directions.—The usual anchorage off Tacloban is from 1½ to 2 cables northward and north-westward of the town, although there are greater depths farther northward. Vessels drawing not more than 20 feet (6^m1) can enter the harbour from southward, but larger vessels should anchor in the vicinity of Dio islet, in depths of 5 or 6 fathoms (9^m1 or 11^m0), mud.

A red conical buoy, No. 40, is moored on the north-western side of the entrance to the anchorage about 3½ cables north-westward of Panirugan point.

Charts 3826, 3840.

A vessel from southward should pass about 2½ cables northward of No. 3 light-buoy (page 577) and thence steer 291° through the recommended track described on page 577, until midway between No. 9 buoy and No. 10, light-buoy, when she should steer 351°, which leads westward of Egbert shoals to the entrance of the dredged channel leading into San Juanica strait. She should then keep the eastern pair of leading beacons in line, bearing 004°, until the western pair are in line, bearing 327°, when she should keep on this alignment until abeam of No. 9 buoy, and then steer about 290° for about 8 cables, when she should alter course westward and pass northward of the black can buoys. A vessel entering by this channel should have no difficulty if the buoys are in position. If they are not, when Mount Danglay (Danglai), 1,177 feet ($358^{m}7$) high, situated on the south-western side of Samar, bears 302°, she should steer for it on this bearing until Anibong point, about 1¼ miles north-westward of Panirugan point, bears 273°, which latter bearing will lead through the middle of the channel to the entrance to San Juanico strait; when nearing Panirugan point, she should haul gradually southward to the anchorage off Tacloban.

Tacloban.—Tacloban (Takloban), the largest town of the province of Leyte, is situated on the southern side of the southern entrance to San Juanico strait. There are two wharves, one of which has a depth of 21 feet ($6^{m}4$) alongside. The Government wharf is 1,200 feet ($365^{m}8$) long, and had a least depth of 24 feet ($7^{m}3$) at its head in 1950; it is equipped with a crane with a lifting capacity of 30 tons. Fresh water is laid on to the pier. There is a hospital at Tacloban.

Communication.—Radio station.—There is regular steamer communication with Manila and other ports in the Philippines.

Tacloban is connected to the general telegraph system.

There is a radio station at Tacloban. *See* page 14.

Storm signals.—Storm signals are shown at Tacloban. *See* page 11.

SAN JUANICO STRAIT AND APPROACHES.—San Juanico strait, which separates the islands of Samar and Leyte, is entered at its southern end between Panirugan point (*Lat. 11° 15′ N., Long. 125° 00′ E.*) and Binatac (Binatak) point, about one mile northward; it has a least width of about a quarter of a mile, but the navigable channel is reduced in two places to barely one cable by shoals on either side, with a least depth of 3 fathoms ($5^{m}5$) in the fairway. The shores are low and fringed with mangroves. The tidal streams at times attain a rate of from 4 to 5 knots in some parts of the strait, and form violent eddies and tide-rips. There are several villages on both sides of the strait.

For pilots, *see* page 578.

Dangers.—Beacons.—Buoyage.—There are numerous dangers in San Juanico strait, the positions of which may best be seen on the chart. Only those lying in the fairway and those marked by beacons or buoys are described below.

A black conical buoy, No. 39, is moored on the northern side of the entrance to the strait about half a mile west-south-westward of Binatac point.

A bank, with depths of 6 fathoms ($11^{m}0$), and less, over it, and a least depth of 27 feet ($8^{m}2$) over its north-western end, lies in the fairway of the southern entrance to the strait about midway between Panirugan and Binatac points.

Two beacons are situated on a shoal with a depth of 7 feet ($2^{m}1$) over it, about 2 cables north-north-westward of Anibong point.

Amandayehan is a village situated 6½ cables north-westward of Binatac point. There is a pier with a berth 100 feet ($30^{m}5$) long, with a least depth of 12 feet ($3^{m}7$) at its head. There is a ferry service with Tacloban, and steamers call occasionally from Cebu.

A black beacon, No. 37, is situated on the eastern side of the fairway, 8½ cables northward of Anibong point.

Bacalan (Bakalan), Lazareto, Redondo and Bagacay (Bagakai) islets lie on the south-western side of the fairway within about one mile north-westward of Anibong point.

A shoal, with a depth of 16 feet ($4^{m}9$) over it, lies in mid-channel, about one mile north-north-westward of Anibong point. Vessels should pass north-eastward of it. Red barrel buoys, Nos. 34 and 32, situated, respectively, about 6 cables and 1½ miles north-north-westward of Bagacay islet, mark the western side of the fairway.

Tinaogan point lies on the eastern side of the strait about 2¼ miles north-westward of Binatac point. About three-quarters of a mile farther northward, lying in the middle of the strait are Kabalawan islets. A shoal, with a depth of about one foot ($0^{m}3$) over it, lies about 3 cables northward of the northern Kabalawan islet, and is marked on its western side by a black barrel buoy, No. 31. The channel between this buoy and the 16-foot ($4^{m}9$) shoal west-south-westward of it is about 1½ cables wide. There is another 16-foot ($4^{m}9$) patch lying about 3 cables west-south-westward of the southern extremity of Cangom (Kangom) islet, situated 6¾ cables northward of the northern Kabalawan islet.

A red beacon, No. 30, stands on a shoal, with a least depth of 10 feet ($3^{m}0$) over it, about 3½ cables eastward of Cauayan (Kauayan) point, situated on the western side of the strait about 9 cables northward of Cangom islet. Vessels should pass eastward of the beacon and close the Samar coast, passing thence between Bagasumbut islets, 55 and 62 feet ($16^{m}8$ and $19^{m}8$) high, on the west, and Dampigan islet (*Lat. 11° 21′ N., Long. 124° 59′ E.*), on the east.

A red barrel buoy, No. 28, is moored close eastward of a shoal, with a depth of 15 feet ($4^{m}6$) over it, situated about 7 cables north-eastward of Cauayan point; a black barrel buoy, No. 27, is moored close north-westward of a 10 foot ($3^{m}0$) patch, situated about 1½ miles north-north-eastward of the same point. Vessels should pass westward of No. 27 buoy, thence between Caracapan (Karakapan) islets, situated about one mile northward of Bagasumbut islets, on the west, and Uson islands, on the east.

A black beacon, No. 25, stands on the western edge of a shoal lying about 3 cables eastward of Uban point, about 2 miles north-north-eastward of Cauayan point. Vessels should pass westward of the beacon, between it and a drying reef about one cable westward, on which stands a red beacon, No. 24.

A red conical buoy, No. 22, marks the eastern edge of a 2 fathom ($3^{m}7$) patch about half a mile north-north-eastward of Uban point.

About 1½ cables northward of this buoy is a reef, which dries. A shoal, with a depth of 16 feet ($4^{m}9$) over it, lies in the fairway, about 1¼ cables south-westward of Bagalibas island, 70 feet ($21^{m}3$) high, situated on the eastern side of the strait, about one mile north-north-eastward of Uban point. About 1½ cables northward of Bagalibas island are Guintiguian islets, the northern of which is 70 feet ($21^{m}3$) high. Torre island, 25 feet ($7^{m}6$) high, lies on the eastern side of the fairway about 9 cables northward of Guintiguian islets.

A red beacon, No. 20, stands on a rock which dries, situated about

Charts 3826, 3840.

one cable eastward of Nababuy (Nababui) island, about 2¾ miles northward of Uban point; about 3 cables south-south-eastward of this beacon is a rocky shoal, with a depth of one foot ($0^{m}3$) over it, on which stands a beacon, painted in red and black horizontal bands.

A red barrel buoy, No. 18, is moored on the north-eastern edge of a shoal, with a least depth of 10 feet ($3^{m}0$) over it, situated about 1½ cables north-eastward of the north-eastern extremity of Nababuy island.

Bacol (Bakol) island lies westward of Guintiguian point, situated 1¾ miles northward of Uban point, and is composed of low wooded hills and mangrove swamps; a narrow boat channel fringed with mangroves separates the island from the coast of Leyte.

Nababuy island, 97 feet ($29^{m}6$) high, divides the strait into two channels, the northern of which is generally used. Anajao (Anahao) island, 54 feet ($16^{m}5$) high, lies 1½ cables north-westward of Nababuy island; its north-western extremity should be given a berth of three-quarters of a cable. Santa Rita island, 2 cables north-westward of Anajao island, is over 100 feet ($30^{m}5$) high, and fringed by a reef which extends about half a cable from its western side; the island may be identified by a square topped bushy knob.

The northern entrance to San Juanico strait lies between the northern point of Bacol island and Santa Rita island. There are heavy tide-rips in this channel.

Janabatas channel.—Jabanatas (Hanabatas) channel, the western approach to the northern end of San Juanico strait, is entered from westward between Baluarte point (page 413) and Diutay (Diutai) point, about 2¾ miles north-north-eastward. It is encumbered with several islets and shoals, and there is a least depth of 2 fathoms ($3^{m}7$) in the fairway northward of Navahay (Navahai) island, about 5½ miles eastward of Baluarte point. The passage northward of Navahay island should not be attempted without local knowledge, as there is a 3-foot ($0^{m}9$) patch in the fairway about half a mile north-eastward of Navahay island and other depths of less than 2 fathoms ($3^{m}7$).

The land on both sides of the entrance is high and well wooded. Both shores are indented by several bays, into which small streams discharge; they are all shallow and of little value to shipping. On the southern side from west to east are:—Opong bay, Sogod cove, on the western side of which is a pier, with a depth of 2 feet ($0^{m}6$) at its head, Tabaltabal, Dongon and Malibago bays; on the northern side is Libtong bay, entered on the eastern side of Tinigrapo point, situated about 3½ miles eastward of Diutay point. Numerous small villages are scattered along the shores, of which Santa Rita, on Samar, 1¾ miles north-westward of Santa Rita island; Babatngon, Samputan, and Malibago, on Leyte, about 1¾, 5½, and 6¾ miles eastward, respectively, of Baluarte point, appear to be the most important.

Pilots.—*See* page 578.

Islands.—**Light.**—**Beacons.**—**Buoy.**—Canauay (Kanauai) island, on the southern side of the fairway, about 2 miles eastward of Baluarte point, is 117 feet ($35^{m}7$) high in the north-western part. It is covered with trees except on the northern slope of the above elevation, which is cultivated.

A light is exhibited, at an elevation of 32 feet ($9^{m}8$), from posts, over a white hut, on the northern side of Canauay island (*Lat. 11° 26′ N., Long. 124° 51′ E.*).

Charts 3823, 3808, 3810, 943, 1263.

Charts 3826, 3840.

Ivantacut (Ivantakut) islet, about 1½ miles east-north-eastward of Canauay island, is low, rocky and covered with bushes. The usual track of vessels lies about a quarter of a mile northward of it, but small craft sometimes use the channel southward of the islet; as the depths, however, are uneven and the bottom rocky, it is not recommended. A spit, with a depth of one foot ($0^{m}3$) at its outer end, extends about 1½ cables northward from the islet. A red barrel buoy, No. 2, is moored close northward of its northern edge.

Caltagan (Kaltagan) island, 179 feet ($54^{m}6$) high near the northern end, and fringed with mangroves, lies close to the Leyte shore, from which it is separated by a narrow boat channel, about 4 cables east-south-eastward of Binuntuan point, situated about 4 miles eastward of Baluarte point. A red beacon, No. 4, stands on the edge of the bank extending about 1½ cables from the north-eastern side of Caltagan island.

Dabun islet, on the northern side of the channel, 8½ cables north-eastward of Caltagan island, is 112 feet ($34^{m}1$) high and wooded. A rocky ledge, which dries, extends about a quarter of a mile north-westward from the islet; a spit, with a depth of 9 feet ($2^{m}7$) at its outer end, on which stands black beacon, No. 3, extends about three-quarters of a mile westward, and a bank, with depths of less than one fathom ($1^{m}8$) over it, extends about the same distance eastward.

Navahay (Navahai) island (*Lat. 11° 26′ N., Long. 124° 54′ E.*), about three-quarters of a mile eastward of Caltagan island, is 111 feet ($33^{m}8$) high, and wooded. A rocky patch, with a depth of 3 feet ($0^{m}9$) over it, lies about three-quarters of a mile eastward of the northern end of Navahay island. A black beacon, No. 5, is situated about three-quarters of a mile north-westward of the northern extremity of the island.

Samputan pass.—Beacons.—Buoys.—Samputan pass, entered between Samputan point, situated 2 miles south-eastward of Binuntuan point, and Navahay island, has a least depth of 21 feet ($6^{m}4$) in the fairway, and a least width of about one cable. Three beacons are situated on Samputan point, one of which forms the rear beacon of the leading marks for the north-western and eastern reaches.

The rear beacon is surmounted by two triangular targets, point down, painted white with a black vertical stripe, one facing each reach of Samputan pass, at an elevation of 200 feet ($61^{m}0$).

The front beacons for each reach consist of a column, with a triangular topmark, point up, painted white with a black vertical stripe, at an elevation of 60 feet ($18^{m}3$), situated north-westward and east-north-eastward, respectively, of the rear beacon.

The front beacon for the north-western reach in line with the rear beacon, bearing 146°, leads through the north-western reach of Samputan pass, in a least depth of 22 feet ($6^{m}7$), passing between beacons, Nos. 4 and 5 (*see* above) and between a red beacon, No. 6, and a black can buoy, No. 7, situated, respectively, about 5 and 3½ cables westward of Navahay island; the front beacon for the eastern reach in line with the rear beacon, bearing 251°, leads through the eastern reach in a least depth of 21 feet ($6^{m}4$). The three-fathom line northward of the eastern reach is marked by a black beacon, No. 13, and a black can buoy, No. 11, situated, respectively, about 1¾ miles eastward and half a mile south-eastward of the southern extremity of Navahay island. A black beacon, No. 9, is situated about 1¾ cables southward of the southern extremity of Navahay island.

Charts 3823, 3808, 3810, 943, 1263.

Charts 3826, 3840.

When passing from one leading line to the other vessels should keep about midway between No. 9 beacon and Samputan point.

Chart 3826.

EASTERN SIDE OF LEYTE.—Coast.—Between Vigia point (page 575) and the mouth of Cadacan (Kadakan) river, about 20 miles southward, the coast, with the exception of Liberanan head, about 4¼ miles southward of Vigia point, is mostly low, flat, and thickly wooded, and is steep-to in places. There are several rivers which discharge on this coast, but they are small and of little use to shipping. The principal towns are Tolosa, on the southern side of Vigia point, Dulag and Abuyog, 6½ and 19 miles southward, respectively, of Vigia point. Hemp and copra are the principal exports.

Anchorage, sheltered only during the South-west monsoon, may be obtained by vessels with local knowledge anywhere between Vigia point and Taytay point, about 22 miles south-south-eastward.

Liberanan head, about 400 feet ($121^{m}9$) high, and Catmon (Katmon) hill, 1,400 feet ($426^{m}7$) high, 2¼ miles north-westward, are prominent. The town of Dulag may be identified by its numerous galvanised iron roofs. Abuyog is situated on the northern side of the entrance to Cadacan river, and is noticeable for the galvanised iron roofs of the church and barracks. Small craft, drawing not more than 5 feet ($1^{m}5$), can cross the bar at high water and reach the town.

Off-lying dangers.—Buoys.—A 5 fathom ($9^{m}1$) patch, marked by a conical buoy, lettered G, and a 28-foot ($8^{m}5$) patch, marked by a can buoy, lettered A, both painted in red and black bands, lie about 1¾ and 3¾ miles, respectively, south-eastward of Vigia point. A bank, with a least depth of 9 feet ($2^{m}7$) at its south-western extremity, lies 4½ miles south-eastward of Vigia point (*Lat. 11° 04′ N., Long. 125° 02′ E.*). There are several other shoals, the positions of which may best be seen on the chart, with depths of from 13 to 39 feet ($4^{m}0$ to $11^{m}9$) over them, lying between the outer shoals described above and the coast of Leyte between Vigia point and Liberanan head. A 33-foot ($10^{m}1$) patch lies about 8 miles east-north-eastward of Liberanan head.

A 6-fathom ($11^{m}0$) patch and a 4-fathom ($7^{m}3$) patch lie about 3½ and 7½ miles, respectively, east-south-eastward of Liberanan head. A 7-fathom ($12^{m}8$) patch, and a 45-foot ($13^{m}7$) patch about 7 cables southward of it, lie about 7 miles south-eastward of Liberanan head. Two shoals, with depths of 27 feet and 34 feet ($8^{m}2$ and $10^{m}4$) over them, lie one mile and 1½ miles offshore, respectively, 5½ miles southward of Liberanan head. A shoal, with a depth of 5½ fathoms ($10^{m}1$) over it, lies about 4½ miles offshore and about 8½ miles north-north-westward of Taytay point ; a depth of 7 fathoms ($12^{m}8$) was reported, in 1945, about 4 cables northward of this shoal.

Taytay point is a sharp rocky headland, with a prominent wooded hill, about 100 feet ($30^{m}5$) high near its extremity. The land within rises to an elevation of 1,025 feet ($312^{m}4$) about 1¼ miles west-south-westward of it. A narrow rocky ledge, about 3 feet ($0^{m}9$) high, extends about one cable east-north-eastward from the point, and half a cable northward of this ledge is a rock, 15 feet ($4^{m}6$) high, and steep-to. About 9 cables southward of the point is a rocky islet, 57 feet ($17^{m}4$) high, and 1¼ cables offshore.

Charts 3808, 3810, 943, 1263.

Chart 3826.

SURIGAO STRAIT.—General remarks.—Surigao strait, the only passage for large vessels from the Pacific to the interior waters of the Philippines, with the exception of San Bernardino strait, is famous for having been traversed by Magellan when he crossed the Pacific ocean and discovered the Philippine islands in 1521. It is of advantage to vessels proceeding to the southern part of the Philippines or to the Sulu sea, and is sometimes used by steamers from Australia that wish to escape the full force of the North-east monsoon.

The main strait is safe and deep throughout its length, and the coasts of the islands that border it are steep-to. The entrance to the strait from the Pacific is between Suluan island on the north and the island of Dinagat on the south; the western side of the strait is formed by the south-eastern side of Leyte and Panaon island; the southern entrance is between the southern end of Panaon island and Bilaa point, the northern extremity of Mindanao, and the eastern side by the islands lying northward of the north-eastern part of Mindanao.

Suluan island.—Light.—Suluan island (*Lat. 10° 46′ N., Long. 125° 57′ E.*), on the northern side of Surigao strait, lies about 10½ miles south-south-eastward of Sungi point (page 572). Near the western point are two hills, the eastern and higher of which has an elevation of 204 feet (62^{m}2). The eastern side of the island is formed by a coral ridge, which attains its greatest elevation of 410 feet (125^{m}0), and has the same characteristic features as those between Pambuhan harbour and Sungi point on the island of Samar (*see* page 572). The south-western half of the island is a low plain covered with coconut groves.

From the western point of the island, a reef, which partly dries, extends nearly one mile south-westward, and a similar reef extends three-quarters of a mile from the south-western side of the island between the southern point and Granadas village, about 1¼ miles north-westward. A sunken rock lies about 2 cables southward of the southern extremity of the island. There are a number of islets and rocks, all of which, except two, 35 and 40 feet (10^{m}7 and 12^{m}2) high, close off the southern side, lie on the reef which fringes the island; the largest and highest of these lies northward of the western extremity, and has an elevation of 163 feet (49^{m}7). The northern and eastern sides of the island are free from dangers outside the fringing reef.

A light is exhibited, at an elevation of 425 feet (129^{m}5), from a white wooden framework tower, on the summit of Suluan island, about half a mile northward of the southern extremity.

Anchorage.—The only partly sheltered anchorage off Suluan island is off the western side, in a depth of 6 or 7 fathoms (11^{m}0 or 12^{m}8), sand, about 6 cables south-south-westward of the 204-foot (62^{m}2) hill on the western point and the same distance westward of Granadas village. This anchorage is sheltered from winds from north-west, through north, to south-east. The only landing place on the island is abreast the anchorage.

Homonhon island.—Homonhon island lies with Cagosoan (Kagosoan) point (*Lat. 10° 43′ N., Long. 125° 49′ E.*), its eastern extremity, about 7½ miles westward of Suluan island, and on the northern side of Surigao strait; it is 1,120 feet (341^{m}4) high in the north-western part and densely wooded, and the coast is partially bordered with coconut trees. The island is fringed by reefs, which do not extend more than half a cable offshore, except in Casogoran (Kasogoran) bay,

Charts 3808, 3810, 943, 1263.

Chart 3826.

on the north-eastern side, where it extends as much as 3 cables. Montoconan (Montokonan) islet, 109 feet (33m2) high, and covered with coconut trees, lies about half a mile from the western side of Homonhon island, to which it is connected by a drying reef, on which is a small islet with a few bushes on it. Several detached shoals, with depths of from one to 27 feet (0m3 to 8m2) over them, lie within one mile of the southern extremity of Montoconan islet, and from a half to one mile of the western side of Homonhon island. The island is sparsely populated; most of the inhabitants live in the village of Homonhon, at the head of Casogoran bay. The chief product of the island is copra.

Between Homonhon and Suluan islands are a number of parallel ridges, with depths of from 6½ to 10 fathoms (11m9 to 18m3) over them.

Anchorages.—Light-buoy.—Homonhon island affords no good anchorages, and is seldom visited, except by the smaller native craft. Vessels with local knowledge wishing to communicate with the village of Homonhon can anchor in a depth of 23 fathoms (42m1), coral and sand, about one mile eastward of the village and about 3½ cables offshore. This is only a fine weather anchorage; easterly swells roll in heavily, but it is partly protected from south-easterly seas. Landing may be made in a break in the reef in front of the village, but a better landing can be effected about 1¼ miles north-westward of the village; in this break there is a rock, with a depth of one foot (0m3) over it, marked by a wooden post, which should be left on the starboard hand on entering.

The best anchorage at Homonhon island is eastward of the southern end of Montoconan islet, in the middle of the bight, in depths of from 6 to 11 fathoms (11m0 to 20m1), sand; vessels are sheltered here from all winds except those between south and south-west. The clearest approach to this anchorage is from southward by following the western coast of Homonhon at a distance of a quarter of a mile.

A conical light-buoy, No. 2, painted red, exhibiting a *red flashing* light *every four seconds* is moored about 9 cables south-south-eastward of Pagbabacnan (Pagbabaknan) point (*Lat. 10° 42′ N., Long. 125° 45′ E.*), the south-western extremity of Homonhon island.

WESTERN SIDE OF SURIGAO STRAIT.—Coast.—Hingatungan (Hinatungan) point lies about 8½ miles south-eastward of Taytay point (page 583), and has the appearance of a long, low, heavily wooded point; it is bordered by a narrow reef. Extending about 1½ cables from the southern side of the point are several rocks; the outer one, awash, is close southward of the outer rock above water, which is about 4 feet (1m2) high. All these rocks are of a dark colour and do not show well when the sea is smooth. Between Taytay point and Hingatungan point there are no dangers outside half a mile from the coast.

Hingatungan (Hinatungan) village is situated at the head of an opening in the coastal reef about 6 cables north-north-westward of Hingatungan point. Small craft with local knowledge may obtain shelter here in any weather.

About one mile southward of Hinatungan point foul ground extends about a quarter of a mile offshore; on the outer end of it is a rock with a depth of 2 feet (0m6) over it, which frequently breaks. About

Charts 3810, 943, 1263.

Chart 3826.

one cable south-westward of this rock is a group of rocks which dries, separated from the coastal reef by a channel half a cable wide.

A shoal, with a depth of 34 feet ($10^{m}4$) over it, lies about 6 cables south-south-eastward of Hingatungan point (*Lat. 10° 35′ N., Long. 125° 11′ E.*).

Pelada rock, 34 feet ($10^{m}4$) high, lies about 1¼ miles southward of Hingatungan point, and 4 cables offshore. It is steep-to, and there is a channel a quarter of a mile wide between it and the coastal reef. In a small bay westward of Pelada rock there is fair shelter and a good landing place for small craft with local knowledge during heavy north-easterly weather.

A group of rocks, which mostly dry about 2 feet ($0^{m}6$), with one about 6 feet ($1^{m}8$) high, lies about 1¼ miles south-westward of Pelada rock and 3½ cables offshore. The channel between the group and the coast is shallow and should not be used.

The village of Silago stands at the mouth of the river of the same name, 3¼ miles south-south-westward of Hingatungan point. Sogod point, 3¾ miles south-south-eastward of Silago, is low and wooded, and fringed by a narrow reef. Saingan point, 2 miles southward of Sogod point, is composed of dark rock, and is low and steep-to.

Off-lying islands.—Cabugan (Kabugan) islands, which are inhabited, consist of Cabugan (Kabugan) Grande and Cabugan (Kabugan) Chico ; they lie about 2 miles offshore between Sogod and Saingan points, with a deep channel, clear of dangers in the fairway, between them and the coast of Leyte. Cabugan Grande island is 180 feet ($54^{m}9$) high, without any prominent hill. Cabugan Chico island, 300 feet ($91^{m}4$) high, and cone-shaped, lies about 8 cables south-south-westward of Cabugan Grande island. A spit, with a depth of 2 fathoms ($3^{m}7$) over it, extends about 2 cables southward from the southern extremity of Cabugan Grande island, and a bank, with a depth of 25 feet ($7^{m}6$) at its outer end, extends about 4 cables from the north-eastern side of Cabugan Chico island, leaving a deep channel between them about a quarter of a mile wide ; tide-rips occur in this channel.

Coast.—Hinunangan bay is entered between Saingan point and Pandan point (*Lat. 10° 24′ N., Long. 125° 14′ E.*), about 4 miles south-south-eastward. The shore bank, with depths of less than 3 fathoms ($5^{m}5$) over it, extends about 3½ cables from the southern end of the bay. The town of Hinunangan is situated on the northern side of the mouth of Malaga river, about 2 miles westward of Pandan point. The bar of this river is very shallow. Anchorage may be obtained by vessels with local knowledge off the town according to draught. During the North-east monsoon, when it is too rough to lie off the town, partial shelter from Cabugan islands may be obtained off Kanipaan village, about 1½ miles north-north-westward of Hinunangan. Good shelter may also be found under the lee of Cabugan islands, but the depths are greater there.

Pandan point is composed of coral rock, from 12 to 15 feet ($3^{m}7$ to $4^{m}6$) high, and wooded on top. The land within, known as the Anan hills, rises to an elevation of about 1,000 feet ($304^{m}8$), about one mile south-westward, and is well wooded. Bugho point, about 2 miles south-south-eastward of Pandan point, is low and fringed with a narrow reef ; the land within is wooded and rises steeply.

Charts 3810, 943, 1263.

Chart 3826.

From Pandan point to Anahawan village, about 7½ miles southward, the coast is fringed by a narrow reef, and thence to Himatagon, at the head of Cabalian (Kabalian) bay, about 7 miles westward, there is a steep cobblestone beach, which is steep-to. The coast is bordered by coconut groves and is densely populated.

Hinundayan cove, lying on the southern side of Bugho point, affords anchorage during fine weather to vessels with local knowledge, in a depth of 7 fathoms (12^{m}8), about 2 cables offshore, with the church at Hinundayan, a village at the head of the bay, bearing 243°, and Bugho point, 026°. A detached reef, with a depth of 22 feet (6^{m}7) over it, lies in the southern part of the cove, about 3½ cables offshore. Amagusan point, about 6½ miles southward of Bugho point, is low, covered with coconut trees, and steep-to. Mount Cabalian (Kabalian), the most prominent mountain in the vicinity of Surigao strait, is 3,100 feet (944^{m}9) high, and lies about 2¾ miles north-westward of Amagusan point. It is cone-shaped, with the upper part broken off, and ends in three main peaks, the central one being the highest ; the upper part is wooded.

Cabalian (Kabalian) and Himatagon are the principal towns on the northern side of Cabalian bay, which is entered between Amagusan point and Mangayao point, 8½ miles south-westward. There are considerable depths off these towns and anchorage is only tenable during the North-east monsoon. Himbangan river discharges into the head of Cabalian bay, about half a mile westward of Himatagon.

The peninsula terminating at Panaon strait (page 483) forms the western side of Cabalian bay and is traversed by a range of densely wooded hills, broken up into small peaks. They approach close to the eastern coast, and form a series of steep, rocky bluffs, interspersed with short sandy beaches. Marangay (Marangai) point, about 4½ miles southward of Himatagon, is a bold, wooded bluff, 200 feet (61^{m}0) high, descending steeply to the rocks at its foot. Two rocky islets on the outer edge of the reef extending from Molopolo village, 1½ miles southward of Marangay point, are prominent.

Mangayao point (*Lat. 10° 10′ N., Long. 125° 08′ E.*) is a small rocky promontory, precipitous at its end, about 50 feet (15^{m}2) high, wooded on top, and steep-to.

A shoal, with a depth of 21 feet (6^{m}4) over it, lies about 6 cables eastward of Mangayao point with a deep channel over a quarter of a mile wide, between.

Panaon island and strait have been described on page 483.

EASTERN SIDE OF SURIGAO STRAIT.—Coast.—The eastern side of Surigao strait is formed by the west coast of Dinagat. The eastern side of Dinagat is described on page 602.

Dinagat.—The island of Dinagat is indented on its western side by a number of bays, in which there are considerable depths, which afford good sheltered anchorages to vessels with local knowledge ; it is fronted by numerous islands. The eastern side of the island is more regular and contains few good harbours. A chain of mountains extends along the east coast, the highest point of which is Mount Redondo, with an elevation of 3,066 feet (934^{m}5), situated about 7 miles from Desolation point, the northern extremity of the island.

There are no rivers of importance on the western side ; on the east

Charts 3810, 943, 1263.

Chart 3826.

coast there are two inlets, into which a number of rivulets discharge, which are navigable for small vessels with local knowledge. The island is mostly wooded and sparsely populated. The principal exports are hemp and copra.

Desolation point, is low, rocky and bold, and may be passed close-to. The land within rises steeply to an elevation of 1,420 feet ($432^{m}8$), about 1½ miles from the point.

Babatnon point, about 4¼ miles south-south-westward of Desolation point, is low and wooded. Between them are Kanamong, Kanpintak and Panamauan points, all low heavily-wooded and steep-to, but not prominent; in the bays between these points are sand beaches, with coconut trees, and a few houses. Panamauan bay, on the eastern side of Babatnon point, is much encumbered by reefs, but small craft with local knowledge may obtain partially sheltered anchorage there.

Off-lying islands and dangers.—Light.—Kayasa islets are two rocky, wooded islets, 115 and 120 feet ($35^{m}0$ and $36^{m}6$) high, lying about 2¼ miles west-north-westward of Babatnon point, and about 3½ cables apart. A rocky shoal, with a depth of one fathom ($1^{m}8$) over it, lies 3 cables north-westward of the northern islet, and a rock, awash, lies about 1¼ cables westward of the southern islet. The tidal streams run at a maximum rate of 5 or 6 knots in the vicinity of these islets, which should be given a wide berth.

Hibuson island, about 4 miles north-westward of Berrugosa point (*Lat. 10° 23′ N., Long. 125° 33′ E.*), situated 3½ miles south-westward of Babatnon point, is 620 feet ($189^{m}0$) high, and wooded. Its coasts are mostly steep-to and there are no off-lying dangers. Anchorage may be obtained by vessels with local knowledge off Hibuson village, situated at the head of Tinaga cove, on the eastern side of the island, in a depth of 20 fathoms ($36^{m}6$), protected from all except easterly winds. A bank, with depths of from one to 2 fathoms ($1^{m}8$ to $3^{m}7$) over it, extends about 3 cables from the southern side of the cove.

A light is exhibited, at an elevation of 50 feet ($15^{m}2$), on Kanhandon point, the north-western extremity of Hibuson island.

Little Hibuson island lies close to the south-western part of Hibuson island, and is practically a part of it, being connected at its northern and southern ends by reefs with a deep basin between them, but the channel leading into it is bordered with mangroves and can only be used by small craft.

Coast.—Looc (Look) bay is entered between Babatnon and Berrugosa points. Berrugosa point, about 600 feet ($182^{m}9$) high, is the northern extremity of the peninsula separating Looc and Tubajon bays. The shores of Looc bay are fringed with a narrow steep-to reef, and there are no detached dangers, except a small drying reef about 1½ cables northward of the village of Loreto, which, with the settlement of Santiago, are at the head of the bay. Loreto cannot be distinguished until abreast of Puyo island. There is occasional steamer communication with Cebu. Puyo island, about a quarter of a mile from the eastern shore of Looc bay, is 120 feet ($36^{m}6$) high and partly wooded. A 15-foot ($4^{m}6$) patch lies nearly midway between the northern part of Puyo island and the coast of Dinagat. Fair anchorage may be obtained by vessels with local knowledge between the south-eastern part of the island and Dinagat, in depths of from 10 to 12 fathoms ($18^{m}3$ to $21^{m}9$), but rather exposed to northerly winds. Vessels may also

Charts 3810, 943, 1263.

Chart 3826.

obtain anchorage, in a depth of 15 fathoms ($27^{m}4$), westward of Puyo island, and half a mile off Loreto.

Tubajon (Tubahon) bay is entered between Berrugosa point and Esconchada point, about 4½ miles south-south-westward. The shores are mostly steep-to. Lisub cove, entered about 2 miles southward of Berrugosa point, is a small indentation in the eastern shore; the entrance is narrow and foul, and can only be used by small craft drawing not more than 6 feet ($1^{m}8$); it is an excellent shelter for boats. The villages of Tubajon (Tubahon) and Santa Cruz are situated at the head of the bay.

Esconchada point is a steep, broad, partly-wooded bluff, over 250 feet ($76^{m}2$) high, bordered by a narrow steep-to, rocky beach. A large part of the central portion of the bluff has a steep rocky face of a dark reddish colour, clear of trees, and is prominent. There are heavy tide-rips off the point, especially with the south-going stream.

Between Esconchada point (*Lat. 10° 19′ N., Long. 125° 31′ E.*) and Tamoyauas point, 4½ miles southward, there are four bays. The northernmost of these is a small cove, with a reef across its entrance, which can only be crossed by boats at high water. Layauan bay, separated from the first by Tambungan point, is about 4 cables wide at the entrance and extends about one mile eastward. The shores are rocky, hidden by mangroves, and bordered by reefs from a quarter to half a cable wide; the head of the bay is encumbered with reefs. There is an arm extending about half a mile northward from the bay near the head; a channel three-quarters of a cable wide, with a depth of 10 fathoms ($18^{m}3$), mud, leads up the middle of this arm for 2½ cables from the entrance. There are depths of from 14 to 23 fathoms ($25^{m}6$ to $42^{m}1$) from the entrance of the bay to a position southward of the sand spit on the western side of the entrance to the northern arm. On entering the north arm the sand spit should be passed close-to. Anchorage, protected from all except westerly winds, may be obtained by vessels with local knowledge in the middle of Layauan bay in, a depth of 16 fathoms ($29^{m}3$); small vessels may enter the northern arm, where there is landlocked anchorage, in a depth of 10 fathoms ($18^{m}3$). Little Layauan bay, close southward of Layauan bay, from which it is separated by a steep rocky bluff, is unimportant; the southern entrance point is a steep cultivated ridge, about 80 feet ($24^{m}4$) high; the greatest depths are on the northern side, where the fringing reef is a quarter of a cable wide, while on the southern side it is more than three-quarters of a cable wide.

Libjo (Libho) bay is entered between Tamoyauas point and Pelotes point, about 2¼ miles south-south-westward. Tamoyauas point is high, densely wooded, and has rocky ledges at its foot. The shores of the bay are fringed with reefs; the middle has considerable depths and is clear of dangers. Pelotes rocks, consisting of two rocks, 120 and 25 feet ($36^{m}6$ and $7^{m}6$) high, covered with trees, and steep-to, lie about three-quarters of a mile northward of Pelotes point.

Pelotes point is the north-western extremity of Tabunan peninsula, which is 590 feet ($179^{m}8$) high, and wooded, and extends about 2 miles north-westward from the coast. The point is rocky and steep. About a quarter of a mile north-eastward of it is a steep rock, 58 feet ($17^{m}7$) high, with some bushes on its summit. The isthmus connecting

Charts 3810, 943, 1263.

Tabunan peninsula with Dinagat is about 3 cables wide and about 100 feet ($30^{m}5$) high. A shoal, with a depth of 33 feet ($10^{m}1$) over it, lies about 4 cables northward of Pelotes point.

Anchorage may be obtained by vessels with local knowledge, in a depth of 17 fathoms ($31^{m}1$), a quarter of a mile north-westward of Libjo (Libho) village, situated at the head of Libjo bay.

At Pelotes point a series of groups of islets and inlets begin, extending 9 miles southward.

Binaliu rocks, two in number, lie nearly one mile west-south-westward of Pelotes point. The larger rock is 13 feet ($4^{m}0$) high, with a flat top, and the other, 9 feet ($2^{m}7$) high, and pointed. The sea breaks over them in moderately heavy weather.

Tabunan islets, consisting of eleven islets and a few rocks above water, lie 4 cables southward of Pelotes point, and extend about the same distance offshore; they are from 50 to 210 feet ($15^{m}2$ to $64^{m}0$) high, and are steep and covered with shrubs. The outer group of four islets is separated from the others by a narrow, deep channel; the inner group lies on the coastal reef.

Dayhangan bay lies on the south-western side of Tabunan peninsula, with the villages of Tabunan and Dayhangan on its north-eastern shore. Tagabaka cove is entered between Tagabaka point (*Lat. 10° 11′ N., Long. 125° 30′ E.*), the southern entrance point of Dayhangan bay, and a well defined point about a quarter of a mile westward of it. There are several islets in the cove, the largest of which lies across the entrance. The channels on either side of this islet are foul, and a depth of not more than 6 feet ($1^{m}8$) can be carried into the cove at high water.

A shoal, with a depth of 1¾ fathoms ($3^{m}2$) over it, lies about 3½ cables north-north-westward of the western entrance point of Tagabaka cove, and a rock, above water, lies about a quarter of a mile westward of the same point; a shoal, with a least depth of 3 fathoms ($5^{m}5$) over it, and steep-to, lies about one mile west-south-westward of the same point.

Off-lying island and reef.—Kanihaan island, about 2 miles west-south-westward of the western entrance point of Tagabaka cove, is 167 feet ($50^{m}9$) high, and covered with tall grass and coconut trees. Foul ground extends about 2 cables from its northern and southern sides.

A reef, with a least depth of 3 feet ($0^{m}9$) over it, and steep-to, lies about 4 cables westward of Kanihaan island.

Currents.—During the survey in this vicinity currents were experienced setting southward off the points of Dinagat and round Kanihaan island. When they set northward they had, as a rule, little strength, while those setting southward ran at a considerable rate round the northern end of Kanihaan island and the reef westward of it, causing heavy tide-rips and overfalls.

Coast.—Kayabangan island, 220 feet ($67^{m}1$) high, wooded, and rocky, lies about three-quarters of a mile south-westward of the western entrance point of Tagabaka cove. Vessels should not venture among the islets and shoals between it and Dinagat without a favourable light as the ground is foul. The village of Arellano, situated on the coast of Dinagat about 1¾ miles southward of the western entrance point of Tagabaka cove, is bordered by a sandy beach. There is no

Chart 3826.

good anchorage in the vicinity of the village. A shoal, with a depth of 3 feet (0^m9) over it, lies 4 cables north-westward of Arellano.

Kanhanusa island, 325 feet (99^m1) high, lies one mile south-south-westward of Kayabangan island.

Tamburay island lies close southward of Kanhanusa. The passage between these two islands and Dinagat is navigable by vessels with local knowledge ; there is a drying reef in the middle, with deep water on both sides of it, and reefs extend half a cable from the coast of Dinagat just northward of the channel reef and the same distance from the islet near the northern end of Kanhanusa island.

Kayitan bay is entered between Tamburay island and Tungo point, a quarter of a mile south-south-westward of it. Dungoan cove, the entrance to which is encumbered by a reef which dries, extends southward from the southern side of the bay. A fairly good anchorage may be obtained by vessels with local knowledge, in a depth of 21 fathoms (38^m4), mud, about 9 cables inside the entrance of the bay, but care should be taken to avoid a 10-foot (3^m0) patch which lies just outside the entrance to the cove, and also a coral head, with a depth of 3 feet (0^m9) over it, lying about 3 cables eastward of the eastern entrance point of the cove.

Puerto Princesa (San Roque) village is situated about 2¼ miles southward of Tungo point. Close north-eastward of the village there is a hill, 340 feet (103^m6) high, which shows as a perfect cone from north-westward or south-eastward.

Kotkot island, 170 feet (51^m8) high, and thickly wooded, lies close off Puerto Princesa village. It is fringed by reefs which extend about a quarter of a mile from either end ; on that extending from the south-eastern end are Kasundalo islet, 60 feet (18^m3) high and Rabo rock, 25 feet (7^m6) high.

San Roque channel.—San Roque channel, between Dinagat and Kotkot island, has a navigable width of half a cable between the reefs which fringe either side. Abreast Puerto Princesa village (*Lat. 10° 06′ N., Long. 125° 29′ E.*), in the middle of the channel, there is a depth of about 5 fathoms (9^m1). A short distance south-eastward of the village the channel widens to about 3 cables, where good anchorage may be obtained by vessels with local knowledge, in depths of from 22 to 25 fathoms (40^m2 to 45^m7). On the northern side of the anchorage there are two reefs extending about one cable offshore. Southward of the anchorage the channel narrows and is encumbered with reefs, but there is a channel about a quarter of a cable wide between the reefs on either side with a depth of 9 fathoms (16^m5).

Kakub point, at the end of which there is a hill, about 50 feet (15^m2) high, lies about 6½ cables south-eastward of Puerto Princesa village, and forms part of the eastern side of San Roque channel. A reef, on which are the partially-wooded Kanhatid islets, from 22 to 109 feet (6^m7 to 33^m2) high, extends about three-quarters of a mile southward from Kakub point.

About 2 cables south-westward of the southernmost islet, and in the fairway of the southern approach to San Roque channel, are the Twin islets, 60 feet (18^m3) high, lying on a reef, from the northern side of which a spit, with depths of less than 3 fathoms (5^m5) over it, extends 1½ cables. Vessels may pass one cable from either side of these islets when approaching or leaving San Roque channel.

Charts 3810, 943, 1263.

Chart 3826.

Hagakhak island, about 3½ cables southward of Kotkot island, from which it is separated by a deep channel, is 140 feet (42m7) high and wooded. It is fringed by a reef, which extends 2 cables from its north-eastern side, and on which are two islets, 40 and 70 feet (12m2 and 21m3) high. Tinao islet, 35 feet (10m7) high, lies 2 cables north-north-westward of the northern extremity of Hagakhak island; on its western side are two rocky columns. Little Hagakhak island, about 2½ cables westward of the southern end of Hagakhak island, is 110 feet (33m5) high and wooded. Close off its south-eastern point, which is a steep bluff, a rocky ledge, on which there is a rock, 52 feet (15m8) high with some bushes on it, extends three-quarters of a cable south-eastward.

Coast.—Eastward of Kakub point and the Kanhatid islets is a narrow bay with considerable depths, the shores of which are practically a wall of coral, from 10 to 30 feet (3m0 to 9m1) high. Kabun cove, entered 9 cables south-south-eastward of Kakub point, is nearly filled by an islet, 240 feet (73m2) high, the ends of which are connected with the shores by reefs. Kanhatid point, about 2 miles south-south-eastward of Kakub point, has a small islet, 50 feet (15m2) high, close off its extremity, the southern and eastern sides of which are steep-to. Babas cove, close eastward of Kanhatid point, is narrow and has depths of from 11 to 27 fathoms (20m1 to 49m4). Small craft with local knowledge may obtain anchorage, in a depth of 17 fathoms (31m1).

Melgar bay.—Melgar bay, entered between Kambagio point, about 1½ miles east-south-eastward of Kanhatid point, and Kansadok point, about 3½ miles south-eastward of Kambagio point, is backed by high hills lying about 2 miles inland, which, on the northern side, are over 1,000 feet (304m8) high, and are prominent. North-eastward of the bay is a rather broken series of ridges that culminates in Mount Tristan, 2,034 feet (620m0) high, lying 8 miles north-eastward of Kambagio point and 1¼ miles from the eastern coast of Dinagat.

Kambagio point is rocky and steep, and is the base of a conical hill, about 200 feet (61m0) high, covered with grass. A reef, which dries, extends about 4 cables south-eastward from the eastern side of the point, affording protection to the anchorage off Melgar from south-westerly winds. Melgar village (*Lat. 10° 04′ N., Long. 125° 32′ E.*) stands on the north-eastern side of the point.

The northern shore of the bay is rocky and fringed with reefs, which extend 3½ cables offshore in one place. About a quarter of a mile south-south-eastward of Tamehagan point, situated about one mile north-eastward of Kambagio point there is a reef of coral boulders, with a least depth of one fathom (1m8) over it, and steep-to, which usually shows plainly.

Sibukauan island, lying midway between Bilabid point, 3 miles eastward of Kambagio point, and Mahangin point, one mile southward of Bilabid point, is over 100 feet (30m5) high, heavily wooded, and easily identified. The island lies in the entrance to three large inlets, known as Panikian, Tagabaka, and Tagbabui coves. It is joined to Bilabid point, north-westward of it, by a partly-drying reef; its southern side is bordered by a narrow steep-to reef, between which and Mahangin point there is a deep, clear channel about 2 cables wide, leading to the above-named coves, which afford perfectly sheltered anchorage for vessels of moderate size with local knowledge.

Charts 3810, 943, 1263.

Chart 3826.

The only dangers requiring special mention are the reefs off the eastern points of Sibukauan island, which extend about a quarter of a mile, and on which some coral heads dry.

Mahangin point has a black rocky beach and is steep-to. The land rises rapidly from the point and about three-quarters of a mile southward is 490 feet ($149^{m}3$) high. Kanayut point, about 6½ cables southwestward of Mahangin point, has a cliff face about 30 feet ($9^{m}1$) high, which shows up well from all parts of Melgar bay. The peninsula terminating in these two points is well wooded, and very prominent. Kambay (Kambai) cove is three-quarters of a mile wide at the entrance between Kanayut and Kansadok points and extends about the same distance south-eastward. It affords fair anchorage, though the depths are rather great.

Kansadok point is low, rocky, and steep-to; the land within is steep and wooded.

Off-lying islands and dangers.—Unib island, about 2 miles southward of Kambagio point, is 650 feet ($198^{m}1$) high, rugged, and densely wooded; its coast is mostly steep-to. Sibanoc (Sibanok) island, 448 feet ($136^{m}5$) high, is separated from the south-western side of Unib island by a narrow deep channel. Rizal village is situated on the eastern extremity of the island. The island is well populated and cultivated.

Baong rocks are a group 3 feet ($0^{m}9$) high, lying about 3 cables westward of the southern end of Sibanoc island. About three-quarters of a cable westward of Baong rocks is another group of rocks, which dry about 2 feet ($0^{m}6$), and the same distance east-south-eastward there is a group with a depth of one foot ($0^{m}3$) over it. With southwesterly and westerly winds the sea breaks heavily over these rocks.

Viray (Virai) islet, 80 feet ($24^{m}4$) high, and wooded, lies about three-quarters of a mile southward of Unib island. It is fringed by reefs, which, from the north-eastern side, extend 4 cables and partly dry. Likoko islet, a quarter of a mile eastward of the eastern extremity of Sibanoc island, is rocky and has some coconut trees on it. About three-quarters of a cable eastward of Likoko islet is a reef, which dries. There is a narrow deep channel between this reef and the reef fringing Viray islet, and also between Likoko islet and Sibanoc island.

Coast.—About three-quarters of a mile south-westward of Kansadok point (*Lat. 10° 02′ N., Long. 125° 34′ E.*) is Kalavera point, which is fringed by a rocky ledge and shoal water extending a quarter of a mile outside it. The point is 50 feet ($15^{m}2$) high, and close within it is the village of Odok. Matingbi cove, in the middle of the entrance to which is Puyo islet, is entered about three-quarters of a mile southward of Kalavera point.

Kanhinaud point is the western extremity of a peninsula which separates Matingbi cove from Masiub cove, southward of it. It is bordered by mangroves and fringed by a reef which dries. A prominent clump of trees stands on a hill, about 390 feet ($118^{m}9$) high, near the middle of the peninsula. Tagbayakao islet, a cone-shaped rock, 100 feet ($30^{m}5$) high, with some bushes on its summit and mangroves on its inshore side, lies about 1½ miles south-eastward of Kanhinaud point. It is connected to the peninsula northward by a reef which partly dries, and foul ground extends a quarter of a mile south-westward from it.

Charts 3810, 943, 1263.

Chart 3826.

Masiub cove, entered between Tagbayakao islet and Masiub point, about 8 cables eastward, is encumbered with reefs and is of little value to shipping. About one mile southward of Masiub point is Dinagat point, and about midway between them is a rock, awash. Dinagat point is the northern extremity of a promontory, 156 feet ($47^{m}5$) high, on the northern slope of which is the town of Dinagat. On the northern side of the promontory is Dinagat cove, encumbered with reefs.

Dinagat contains two churches, a house painted white with a galvanised iron roof, and numerous native houses. A church and the white house stand on high ground and are prominent.

Off-lying islands and dangers.—Capaquian (Kapakian) island, lying across the entrance to Masiub and Dinagat coves, is 260 feet ($79^{m}2$) high and wooded. On the south-western side are black rocky ledges; the north-eastern side is fringed by a steep-to reef and bordered by mangroves. A reef, partly awash, lies with its outer end about 7 cables south-eastward of the southern extremity of Capaquian island. Dakit rock, 4 feet ($1^{m}2$) high, lies about 4 cables from the western side of Capaquian island. Close southward of the rock are three shoals, the western of which has a depth of about one foot ($0^{m}3$) over it.

Cabilan (Kabilan) islets, two in number, lie on the same reef, about 9 cables south-south-westward of Capaquian island. The western islet is 138 feet ($42^{m}1$) high, and the eastern, 87 feet ($26^{m}5$). The reef on which they lie extends less than one cable from them, and is steep-to. A detached reef, with a depth of about one foot ($0^{m}3$) over it, lies about 3½ cables east-south-eastward of the eastern islet.

Awasan bay.—Awasan bay is entered between Dinagat point (*Lat. 9° 58′ N., Long. 125° 35′ E.*) and Sibale island, about 3½ miles south-south-westward. The northern shore of the bay, as far as the northern entrance to Gabo channel, about 4¼ miles south-eastward of Dinagat point, is fringed by reefs, which extend as much as three-quarters of a mile off. The southern shore, formed by the northern side of Sibale, Hanigad, and Awasan islands, is fringed by reefs, which extend about half a mile off. Between the north-eastern end of Hanigad island, situated close eastward of Sibale island, and the western side of Awasan island, farther eastward, there is a bay, encumbered with reefs and shoals, which is connected at its head with Kantiasay (Kantiasai) bay, also encumbered with reefs and shoals.

Sugbuhan island, covered with trees and grass, lies close off the northern side of the head of Awasan bay. Tagboabo islet, covered with trees and bamboo, lies about 4 cables south-eastward of Sugbuhan island, and marks the northern entrance to Gabo channel.

Sibale island rises in the southern part to a sharp wooded summit, 510 feet ($155^{m}4$) high; the rest of the island is cultivated. It is noticeably greener than the other islands in the vicinity. Hemp and copra are exported. The island is mostly rocky near the points, with sandy beaches in the bays. Zaragoza village is situated at the northern end of the island.

A reef, with a depth of 15 feet ($4^{m}6$) over it, lies about 6 cables westward of the northern extremity of Sibale island, and a bank, with a least depth of 27 feet ($8^{m}2$) over it, lies about a quarter of a mile south-westward of the southern extremity.

Hanigad island, separated from the eastern extremity of Sibale

Charts 3810, 943, 1263.

Chart 3826.

island by a very narrow channel, fringed with mangroves, is 660 feet ($201^{m}2$) high near the north-eastern end; the eastern half of the island is densely wooded, while the south-western part is lightly covered with trees and bushes. The coast is mostly mangrove, but there are sandy beaches and coconut groves on the western side and near Hanigad village, at the southern end of the island. The area between the south-eastern side of Sibale island and Hanigad island is foul.

Awasan island is 560 feet ($170^{m}7$) high, and well wooded. It is fringed by mangroves except at the north-western point, where there is a sandy beach and the only house on the island. Its southern side is separated from Nonoc island by a shallow channel fringed with mangroves which connects Kantiasay bay with Gabo channel.

Nonoc (Nonok) island is separated from the southern end of the island of Dinagat by Gabo channel; the seaward sides are mostly steep and clear of dangers. Mount Conico, 1,100 feet ($335^{m}3$) high, in the western part, is the summit of the island. The ridges of the hills at the western and eastern ends are densely wooded, but between, and especially bordering Gabo channel, the ridges are nearly bare with a bright red soil exposed. On the southern side, at the base of Mount Conico's south-eastern slope, are several prominent green grassy hills.

Gabo channel is the narrow deep channel connecting Awasan bay and Port Gabo. It has a least width of three-quarters of a cable and a least depth of 7 fathoms ($12^{m}8$). The shores are bordered with mangroves and fringed by steep-to coral reefs. The channel is only practicable for small craft with local knowledge, which make the passage with the tidal stream.

Tidal streams.—Low water at the Awasan bay end of Gabo channel occurs at about the same time as high water at the Port Gabo end, and consequently there are violent and swift tidal streams, with dangerous tide-rips and whirlpools near all the points. The times of slack water differ from those of high and low water by two and three hours.

SIARGAO AND BUCAS ISLANDS.—Siargao island, 15 miles eastward of the southern part of Dinagat, is mostly low, the greatest elevation being 903 feet ($275^{m}2$) in the south-western part.

Eastern and southern sides of Siargao island. — Coast. — Sugbuhan point (*Lat. 10° 04′ N., Long. 126° 04′ E.*), the northern extremity of Siargao island, is low and covered with trees and bushes; a reef, which dries, extends about 6½ cables north-north-eastward from it. Between this point and Pilar point, about 12 miles southward, the coast is high and bold, and fringed by steep-to reefs, which dry, extending half a mile eastward from Sugbuhan point, and not more than 2 cables offshore between Arena point, situated about 6 miles southward of Sugbuhan point, and Pilar point. The edges of these reefs can easily be seen, as even in the South-west monsoon there is a continuous line of breakers all along the coast. The land within Arena point rises to a ridge, about 600 feet ($182^{m}9$) high, at less than half a mile from the coast. The villages of Alegria, San Isidro and Caridad (Karidad) are situated on this coast, about half a mile, 2¼ and 10½ miles, respectively, from Sugbuhan point.

Port Pilar, entered between Pilar point and Sharp point, 2 miles

Charts 3810, 943, 1263.

Chart 3826.

south-eastward, affords the best anchorage on the eastern side of Siargao island, but it is not recommended, as even in the South-west monsoon a heavy sea often sets in around Pilar point. A rock above water lies about 1½ cables north-eastward of Pilar point. Pilar village stands on the northern side of the entrance to the Pilar river, which discharges into the north-western corner of the port. A reef, which dries, extends about one mile eastward and 3 cables northward from Sharp point, which is low and covered with coconut trees. The southern shore of the bay is fringed by a reef, which dries, extending as much as 4½ cables off. Isda islet, 120 feet ($36^{m}6$) high, and several large rocks lie on the edge of this reef, 1¾ miles west-north-westward of Sharp point. A reef, which dries, lies about 3½ cables east-south-eastward of Isda islet and 4½ cables offshore. Several streams discharge into the head of the bay.

Anchorage may be obtained by moderate-sized vessels with local knowledge, in a depth of 7 or 8 fathoms ($12^{m}8$ or $14^{m}6$), about half a mile east-south-eastward of Pilar village. Small craft can enter Pilar river and obtain well protected anchorage, one or 1½ cables above the village.

Chart 3810.

Between Sharp point and Tuason point (*Lat. 9° 49′ N., Long. 126° 10′ E.*), about 2½ miles south-eastward, is a shallow bight encumbered with reefs, which partly dry, extending about 8 cables outside a line joining these points. An islet, covered with mangroves, 10 feet ($3^{m}0$) high, lies about 3 cables north-eastward of Sharp point. About three-quarters of a mile and one mile, respectively, south-eastward of this islet are two rocks, each 25 feet ($7^{m}6$) high, lying on the edge of the coastal reef. Between these two rocks there is a deep channel about 3 cables wide, leading to a circular basin, with depths of from 5 to 14 fathoms ($9^{m}1$ to $25^{m}6$), and about three-quarters of a mile in diameter. Another rock, 50 feet ($15^{m}2$) high, lies on the edge of the coastal reef, about 1½ miles northward of Tuason point.

Tuason point is 130 feet ($39^{m}6$) high, and rocky; its sea face is a bluff, 60 feet ($18^{m}3$) high, and is fringed by a narrow, steep-to reef. Between Tuason point and Dolores point, 5 miles south-westward, and thence to the town of Dapa, about 3½ miles westward, the coast is bordered by a sandy beach, with groves of coconuts, hemp, and bananas. General Luna (Kabuntug) village is situated 1¾ miles south-south-westward of Tuason point. Union village stands on the western side of the entrance to Union river, half a mile northward of Dolores point.

Off-lying islets and dangers.—A bank, on which there are three islets and numerous reefs and shoals, both awash and sunken, extends about 4 miles from the south-eastern part of Siargao island between Tuason point and Dolores point. The eastern and southern sides of this bank are formed by a reef, which dries, extending 4½ miles southward from Tuason point and thence westward for about 3½ miles with only two small openings; it is mostly steep-to and is always marked by breakers. Dako islet, 130 feet ($39^{m}6$) high, lies on the south-eastern part of the bank. The reef on which it lies extends about three-quarters of a mile south-eastward from it. Seco reef, which dries, lies about 1¼ miles south-eastward of Dolores point; there is a sand cay on its north-western side. Janoyoy islet is sandy and lies about one mile east-north-eastward of Dolores point and 3 cables offshore. Guyang

Charts 943, 1263.

Chart 3810.

islet, sandy, and covered with coconut trees, lies 2½ miles southward of Tuason point and about half a mile within the eastern edge of the bank.

General Luna village may be approached by small craft through a narrow tortuous channel which crosses the bank between Dolores point and Seco reef, but no vessel should attempt to navigate amongst the reefs without local knowledge.

Two shoals, with depths of 4½ and 5½ fathoms ($8^{m}2$ and $10^{m}1$) over them, lie about 1½ and 1¾ miles, respectively, south-eastward of the sand cay on Seco reef, and a rocky patch, with a depth of 3¼ fathoms ($5^{m}9$) over it, lies 1½ miles southward of the same cay.

Chart 3826.

East Bucas island.—East Bucas (Bukas) island is separated from the southern side of Siargao island by Dapa channel, which is described on page 601. The island is 600 feet ($182^{m}9$) high near the middle and well wooded. Its coast is fringed with reefs, which dry in places, and which, with those adjacent, extend as much as one mile offshore, and on which are several islets and rocks. The village of San Miguel stands on the point of the same name, which is 146 feet ($44^{m}5$) high and sandy, and is the northern extremity of the island. Monserrat village is situated near the middle on the southern side.

Off-lying islands and dangers.—Casulian (Kasulian) island (*Lat. 9° 42′ N., Long. 126° 05′ E.*), lying three-quarters of a mile south-eastward of the south-eastern extremity of East Bucas island, is wooded in the eastern part, where it is 295 feet ($89^{m}9$) high ; the western part is lower and covered with coconut trees. The island is fringed by a bank, with depths of less than 10 fathoms ($18^{m}3$) over it, extending from 1½ to 7 cables offshore ; between it and the reef extending from East Bucas island there is a narrow, deep channel.

About half a mile south-westward of the western end of Casulian island is the northern end of a shoal, on which the sea breaks, with depth of from one foot to 10 fathoms ($0^{m}3$ to $18^{m}3$) over it, which extends about 1¼ miles southward. A shoal, with a depth of 21 feet ($6^{m}4$) over it, lies about half a mile eastward, and shoals, with depths of from 27 to 30 feet ($8^{m}2$ to $9^{m}1$) over it, lie about 1¾ miles eastward, one mile south-eastward and 1½ miles southward of the island.

Middle Bucas island.—Middle Bucas (Bukas) island is separated from the western side of East Bucas island by a narrow boat passage bordered with mangroves, and which at times dries.

Port Castilla is formed by the north-western part of East Bucas island and the north-eastern part of Middle Bucas island. The eastern part and the head of the port are foul. A reef, awash, lies in the middle of the entrance, with a narrow channel on either side of it.

Mount Sibonga, 955 feet ($291^{m}1$) high, a wooded, conical peak in the south-eastern part of the island, is the highest point of the Bucas islands, and is a prominent landmark.

Chart 962, plan of Port Sibonga.

Port Sibonga.—Port Sibonga lies southward of Mount Sibonga, and between the eastern side of Bucas Grande island on the west, and the south-western side of East Bucas island on the east. A reef, which dries, extends about 4 cables southward from the middle of the head of the port, and near its outer end is Banluto islet, 190 feet ($57^{m}9$) high, and wooded.

Anchorage may be obtained by small vessels off the village of

Charts 943, 1263.

Chart 962, plan of Port Sibonga.

Consolacion, on the eastern side of the port, but the depths are very irregular and there are a number of coral heads. The best anchorage is probably midway between Banluto islet (*Lat. 9° 41′ N., Long. 126° 00′ E.*) and the village.

Port Batuecas.—The southern entrance to Port Batuecas (Batuecos) leading from the western side of Port Sibonga is about half a cable wide between the reefs extending from either side, with a least depth of 3½ fathoms (5^{m}9) in the fairway, through which the tidal streams run at a considerable rate. Just inside the entrance a bank, with depths of less than one fathom (1^{m}8) over it, extends about 3 cables northward from the southern side of the port. Good protected anchorage may be obtained close northward of this bank, in a depth of 9 fathoms (16^{m}5), mud. A reef, with a depth of about 4 feet (1^{m}2) over it, lies in the middle of the northern part of the port about 1½ miles from the southern end; a 4½-fathom (8^{m}2) patch lies 2 cables southward of this reef.

The shores of the port are bordered by mangroves, and fringed with reefs which dry in places; they extend 3¾ cables from the eastern side, and entirely close the northern entrance to the port, where it dries one foot (0^{m}3).

Chart 3826.

Bucas Grande island.—Bucas (Bukas) Grande island lies about midway between the south-western side of Siargao island and the north-eastern side of Mindanao. The northern part of the island is a flat-topped ridge, over 800 feet (243^{m}8) high, lightly wooded, and forming bluffs at the coast, nearly bare, and exposing a dark red soil. The southern half of the island is made up of several small peaks, all heavily wooded, the highest having an elevation of 924 feet (281^{m}6) to the tops of the trees. A prominent rock, 4 feet (1^{m}2) high, lies about 3 cables north-eastward of the north-eastern extremity of the island, with which it is nearly connected by a reef.

From the southern entrance point of Port Batuecas to Dahakit point, the southern extremity of the island, the east coast of Bucas Grande island is a series of bold rocky promontories and sandy beaches. At Socorro (Sokorro) village, about 4 miles southward of the southern entrance point of Port Batuecas, there is a break in the coastal reef affording a passage to small craft. Socorro river, close northward of the village, has a depth of one foot (0^{m}3) on its bar, but inside its entrance it is broad and deep for some distance. A shoal, with a least depth of 28 feet (8^{m}5) over it, lies 8 cables offshore, about 1½ miles south-eastward of Socorro village.

Dahakit point and the western side of Bucas Grande island are described on pages 608 and 609, respectively.

Chart 3810.

Off-lying islands.—Lajanosa (Lahanosa), Mamon, and Antokon are a group of islands lying on the same reef about 6 miles south-eastward of Casulian island. On Lajanosa, the northern island, there are three hills, the highest of which has an elevation of 170 feet (51^{m}8). Mamon, the middle island, is 270 feet (82^{m}3) high, and Antokon, the southern island, has three cones, the southern and highest having an elevation of 230 feet (70^{m}1). Between the reef which surrounds the group, on which the sea is always breaking, and that fringing Anajauan island there is a narrow deep channel.

Charts 943, 1263.

Chart 3810.

Anajauan (Anahauan) island, about 1½ miles westward of Mamon island, is wooded and about 200 feet ($61^{\mathrm{m}}0$) high to the top of the trees. It is fringed by a drying reef, and lies on the south-western part of a bank, on which there are a number of sunken rocks and shoals, the southernmost of which lies about 6 cables south-south-eastward of the south-western extremity of the island. A 1½-fathom ($2^{\mathrm{m}}7$) patch lies about half a mile south-eastward of the north-eastern extremity of the island, and a 1¾-fathom ($3^{\mathrm{m}}2$) patch lies at the north-eastern extremity of the bank and 1¾ miles north-eastward of the same point.

A rocky shoal, with a depth of 6 fathoms ($11^{\mathrm{m}}0$) over it, lies 3½ miles west-south-westward of the south-western extremity of Anajauan island, and a rocky patch, with a depth of 7 fathoms ($12^{\mathrm{m}}8$) over it, lies 1¾ miles south-south-eastward of the same point.

Chart 3826.

DINAGAT SOUND.—Dinagat sound lies between Siargao and Dinagat islands. It is encumbered with a number of shoals, but there are deep channels between them.

Halian island, situated in the middle of Dinagat sound, about 4¾ miles westward of Cowhagan islet (page 600), is a low island of coral sand covered with trees, about 80 feet ($24^{\mathrm{m}}4$) high. It lies on the southern part of a large reef which extends about one mile northward from it. Heavy seas break over this reef, but landing can be made a little northward of the western extremity of the island, where there is a sand beach and some houses.

Eastern side of Dinagat sound. — Islands and dangers. — Sugbuhan reef, with a least depth of 9 feet ($2^{\mathrm{m}}7$) over it, lies about 2¾ miles north-westward of Sugbuhan point (*Lat. 10° 04′ N., Long. 126° 04′ E.*). Strong tidal streams set over this reef ; it can be plainly distinguished when the light is favourable.

Between Sugbuhan point and Venus point, 15½ miles south-south-westward, there is an extensive bank, on which there are numerous islands, reefs, and shoals, extending as much as 5 miles from the western side of Siargao island.

About 2¾ miles south-westward of Sugbuhan point is Rizal village, off which a reef, which dries, extends 8 cables, with a group of jagged coral rocks, which are sometimes covered, lying about 4 cables within the edge of the reef. Sapao, the largest town in the vicinity, lies at the head of a cove bordered with mangroves, which is entered about half a mile southward of Rizal. It contains a stone church falling into ruin. Small steamers occasionally call here, anchoring about one mile from the town, in a depth of 7 fathoms ($12^{\mathrm{m}}8$). This anchorage may be approached by vessels with local knowledge either northward or southward of Kambiling islet.

Kambiling islet is a small sandy cay, which dries about 4 feet ($1^{\mathrm{m}}2$), lying 4½ miles south-westward of Sugbuhan point, near the outer edge of the bank, which here extends 2 miles offshore. A 22-foot ($6^{\mathrm{m}}7$) patch lies about 4 cables south-westward of the islet.

Malayo reef, with a least depth of 9 feet ($2^{\mathrm{m}}7$) over it, lies about 3¾ miles west-north-westward of Kambiling islet. A 19-foot ($5^{\mathrm{m}}8$) patch lies 2¾ miles west-north-westward of Kambiling islet ; a shoal, with a least depth of 10 feet ($3^{\mathrm{m}}0$) over it, and a 13-foot ($4^{\mathrm{m}}0$) patch,

Chart 3826.

lie about 1½ miles west-north-westward and 2 miles westward, respectively, of the same islet.

Pagbasayan islet, low, sandy, and wooded, lies near the southern edge of an extensive reef, which dries, about 1¼ miles southward of Kambiling islet, and one mile offshore. Kangun islet, low and sandy, lies at the southern end of a reef, which dries, about 2¼ miles south-westward of Pagbasayan islet. Dahican (Dahikan) island, about 4 cables south-westward of Kangun islet, consists mostly of mangroves, with a small wooded area in the middle.

Litalit bay, formed by Kangun islet and Dahican island, on the west, and the coast of Siargao island, on the east, is encumbered with shoals. San Benito is a small village on the eastern shore of the bay; the village and its sand beach are noticeable from seaward, and may be approached by vessels with local knowledge by entering Litalit bay either northward or southward of Kangun islet.

Poneas island, the largest island off the west coast of Siargao, appears as a group of small peaks, the highest having an elevation of 655 feet (199^{m}6), lying close together, with deep gorges between them. An extensive mangrove flat lies between the higher part of the island and the western part of Siargao, which is of very similar formation to the western part of Poneas island. Sayug channel, which leads to Numancia from the head of Litalit bay, Baban lagoon, and Tona channel, separating Poneas island from Siargao and Tona islands, are shallow, bordered by mangroves, and only navigable by the smaller class of native craft.

Tona island, composed almost entirely of mangroves, lies close southward of Poneas island, and is separated from Siargao island by Libas channel. Laonan island (*Lat. 9° 53′ N., Long. 125° 55′ E.*), 452 feet (137^{m}8) high, and wooded, lies close off the south-western end of Poneas island.

Kangbangyo island, lying 8½ cables westward of the south-western end of Poneas island, has numerous wooded peaks, the highest of which has an elevation of 440 feet (134^{m}1). It is fringed by reefs, on which are several rocks, the highest of which has an elevation of 103 feet (31^{m}4), extending more than half a mile offshore. Cowhagan (Kowhagan) islet, which is low, lies on the reef extending north-westward from Kangbangyo island, and a quarter of a mile within the edge of the bank extending westward from Siargao island. Close northward of it is a rock, 62 feet (18^{m}9) high and wooded.

A shoal, with a least depth of 34 feet (10^{m}4) over it, lies 1¾ miles west-north-westward of the western extremity of Kangbangyo island.

Numancia, the largest town on the west coast of Siargao island, lies 2½ miles north-north-eastward of Venus point; the only part of it visible from seaward is the prominent church tower. The town is approached through Beyobo channel, on the south-eastern side of Tona island, which is narrow and tortuous, and should only be attempted by small vessels with local knowledge. It is reported that vessels of a draught of about 8 feet (2^{m}4) can reach the town at high water and anchor off the pier. The tidal streams in the approach are very strong, and there are dangerous whirlpools in places.

A chain of reefs, part of which dries, extends about 3 miles north-westward from Venus point, parallel with the south-western side of Tona island and about three-quarters of a mile off it. From Venus

Charts 3810, 943, 1263.

Chart 3826.

point to Cambasac (Kambasak) point, about 7½ miles south-eastward, the coast is rocky, bordered with mangroves, and fringed by steep-to reefs, which extend not more than 4 cables offshore.

San Fernando is an unimportant town standing on the northern entrance point of Lumaton river, which discharges into Pamay (Pamai) bay, about 1¾ miles south-eastward of Venus point. The entrance channel is narrow and dangerous, and the tidal streams in the river run at a considerable rate. Anchorage may be obtained by vessels with local knowledge in Pamay bay, in a depth of about 15 fathoms (27^{m}4), mud, half a mile southward of Pamay (Pamai) point, the northern entrance point of the bay, situated about one mile south-eastward of Venus point.

Cambasac point is fringed by a narrow steep-to reef, and may be identified by the village of the same name on it.

Dapa channel.—Islets and dangers.—Dapa channel, between the southern end of Siargao island and the Bucas islands, is half a mile wide between Cambasac point and San Miguel point, the northern extremity of East Bucas island. It is much encumbered with islets, reefs and shoals, leaving three narrow tortuous channels, through which the tidal streams set at a considerable rate. The reefs show plainly, defining the channels, which may be safely navigated by vessels with local knowledge.

Abanay island, 80 feet (24^{m}4) high, lies on the northern side of Dapa channel with its south-western extremity about 2 cables eastward of Cambasac point (*Lat. 9° 45′ N., Long. 126° 02′ E.*). It is fringed by a reef, which, on its eastern side, extends about 1¼ miles east-south-eastward, with a depth of about one foot (0^{m}3) over it, and is known as Dapa reef.

Bancuyo island, 100 feet (30^{m}5) high, and fringed by a reef, is separated from the northern side of East Bucas island by a narrow, tortuous channel, with a least depth of 3½ fathoms (6^{m}4).

The middle channel, between Abanay and Bancuyo islands is the best, having a least width of half a cable between the shoals on either side, and a least depth of 7 fathoms (12^{m}8) in the fairway. The northern channel, between Abanay island and the town of Dapa, which stands about 1½ miles north-eastward of Cambasac point, is very narrow and tortuous, but is used by vessels communicating with the town. The southern channel, between Bancuyo island and East Bucas island, is not recommended.

There is a pier at Dapa, with a depth of 20 feet (6^{m}1) at its head, and from 12 to 13 feet (3^{m}7 to 4^{m}0) alongside. Small steamers call occasionally.

Bucas (Bukas) point, the north-western extremity of Bucas Grande island and the southern entrance point of the western end of Dapa channel, is high and fringed by a reef which extends 2 cables offshore. Bucas (Bukas) cove lies immediately eastward of Bucas point.

Bagum islet, 60 feet (18^{m}3) high, lies on the fringing reef about one cable northward of the northern extremity of Middle Bucas island; foul ground extends about 3½ cables west-north-westward from the islet.

Quico (Kiko) reef, awash and steep-to, lies 8½ cables north-north-eastward of Bagum islet. Barrabas reef, awash and steep-to, lies 9 cables east-north-eastward of Bagum islet.

Charts 3810, 943, 1263.

Chart 3826.

Anchorage may be obtained, in a depth of 5 fathoms ($9^{m}1$), mud, about 4 cables south-westward of the pier at Dapa, approaching from the eastward. Anchorage may also be obtained, in a depth of 16 fathoms ($29^{m}3$), off San Miguel point.

Western side of Dinagat sound. — Coast. — Dangers. — The east coast of Dinagat, which forms the western shore of Dinagat sound, is bold, mountainous, and of a desolate character. The spurs from the mountains approach the coast and terminate in steep cliffs and bluffs. The coast is fringed with reefs extending as much as a quarter of a mile offshore, but it may be safely navigated by keeping outside a line drawn one mile eastward of the salient points, care being taken to avoid the dangerous area eastward of Peñascales point (page 603). There are few places where a landing can be safely effected in bad weather. Owing to the lack of harbours, strong tidal streams and numerous off-lying dangers, these waters are seldom visited by shipping.

Masdang cove, entered 1¾ miles southward of Desolation point (page 587), affords shelter for boats; landing can usually be effected in bad weather.

Malinao inlet, entered about 13½ miles southward of Desolation point (*Lat. 10° 28′ N., Long. 125° 38′ E.*), is about half a mile wide at its entrance, and extends about 1½ miles west-north-westward, whence it divides into two arms which terminate in mangrove creeks. Several detached shoals, with a least depth of 2 fathoms ($3^{m}7$) over them, front the entrance to the inlet and lie within 6 cables of the entrance points. A 25-foot ($7^{m}6$) patch lies nearly one mile north-eastward of the northern entrance point, and 4½ cables offshore.

There is a depth of about 5 fathoms ($9^{m}1$) midway between the entrance points, decreasing gradually to 9 feet ($2^{m}7$) about half a mile inside, and then increasing to 4 fathoms ($7^{m}3$). The inlet affords fairly protected anchorage for small craft with local knowledge at all seasons. Vessels may obtain good anchorage outside the shoals fronting the entrance, during the South-west monsoon.

About 5 miles south-south-eastward of the southern entrance point of Malinao inlet is Peninsula point, 528 feet ($160^{m}9$) high, densely wooded and steep on the eastern side. It is fringed with reefs, which extend about 4 cables from the north-eastern side. About the same distance south-eastward of the point is a shoal, with a depth of 27 feet ($8^{m}2$) over it.

Gaas bay and inlet.—Gaas bay entered, on the northern side of Peninsula point, is about 1½ miles wide at its entrance and extends one mile westward. The shores are fringed with reefs, which extend about 3½ cables from the head of the bay.

Gaas inlet is a deep winding channel, extending from Gaas bay in a general south-westerly direction and terminating in a large, comparatively shallow basin. The inlet has a least width of about three-quarters of a cable and a least depth of 22 feet ($6^{m}7$) as far as Capiyaan islet, about 3 miles from the entrance. The shore is rocky and has a steep slope with mangroves growing at the water's edge. The basin is bordered by mangroves and several rivulets, navigable by small craft, discharge into it. The least depth in the channel through the basin is 9 feet ($2^{m}7$). The inlet should only be used by vessels with local knowledge. Gaas inlet is recommended in preference to Malinao inlet

Chart 3826.

as the entrance is better protected from north-easterly seas, and inside affords perfect protection for small vessels.

Vessels entering Gaas inlet should keep in the middle as reefs extend from both entrance points, and there are large sunken boulders on the northern side.

Coast.—Peñascales point lies about 6½ miles southward of Peninsula point. A steep-to reef, on which there are some black rocks, 22 feet ($6^{m}7$) high, extends a quarter of a mile north-eastward from it ; these rocks show up well from northward or southward.

Off-lying shoals.—Between parallel lines drawn eastward from positions about 1½ miles northward and 3½ miles southward of Peñascales point, and between about 2½ and 8½ miles from the eastern side of Dinagat, are a number of shoals, with depths of from 21 to 42 feet ($6^{m}4$ to $12^{m}8$) over them, the positions of which may best be seen on the chart.

Coast.—Mangli cove, entered 1¼ miles southward of Peñascales point, is encumbered with reefs, and is only suitable for small craft with local knowledge during the South-west monsoon. Lahi bay is entered about 4½ miles southward of Mangli cove ; its shores are fringed by reefs, which extend about half a mile, except on the northern side, where it is narrow.

Kagdyanao bay, lying immediately southward of Lahi bay, is encumbered with reefs. Close eastward of the point which separates the two bays, and on the fringing reef, is Tabuk island, 148 feet ($45^{m}1$) high, wooded, and covered with grass. The reef on which the island lies extends about 4 cables eastward from it. About 3½ cables north-eastward of Tabuk island (*Lat. 9° 56′ N., Long. 125° 41′ E.*) is Sayao island, 127 feet ($38^{m}7$) high and lightly wooded. Between the south-western point of Sayao island and the reef extending from Tabuk island there is a deep channel one cable wide. The remainder of Sayao island is fringed by a reef which extends a quarter of a mile north-eastward from it and surrounds Dakit rock, which is 13 feet ($4^{m}0$) high, and prominent.

Fairly sheltered anchorage may be obtained by small vessels with local knowledge off the village of Kagdyanao, situated at the head of Kagdyanao bay, in a break in the fringing reef, in a depth of 12 fathoms ($21^{m}9$).

Mount Gabo is the summit of a bold promontory extending from the southern end of Dinagat, which is connected with the rest of the island, at a point about 5 miles from the southern end, by an isthmus not much more than 100 feet ($30^{m}5$) high. It is rather a flat-topped ridge sloping gently towards the north and dropping abruptly at the south. The summit, 1,752 feet ($534^{m}0$) high, is densely covered with low scrub, and the lower slopes are wooded with small trees. The coast of the peninsula consists mostly of rocky ledges, with sand beaches in the bights, and is fringed by a narrow, steep-to reef.

Port Gabo, at the southern end of Gabo channel, lies between Dinagat and Nonoc islands. It is well protected, being sheltered by high land on three sides. The port, which is easily made out from seaward, is 9 cables wide at the entrance and extends 1¼ miles westward ; it then forms an elbow southward, turning into Gabo channel. Gabo islet, 98 feet ($29^{m}9$) high, and wooded, lies near the inner end of a reef extending about 4 cables northward from a point situated about

Charts 3810, 943, 1263.

Chart 3826.

7 cables north-westward of the southern entrance point of Port Gabo; there is a depth of 3 fathoms ($5^{m}5$) at the outer end of this reef. Good protected anchorage may be obtained by vessels with local knowledge in the northern part of the port, less than 2½ cables offshore, in a depth of about 15 fathoms ($27^{m}4$).

Charts 3826, 3810.

HINATUAN PASSAGE.—Hinatuan passage connects the Pacific ocean with the southern end of Surigao strait. It lies between the north-eastern end of Mindanao and the islands off-lying it. It is not recommended for a sailing vessel without a pilot on account of the strong tidal streams and whirlpools near Rasa islet, near the western end. It is free from dangers in the fairway, except for Kabo reef (page 613) and Hinatuan rock (page 611).

Pilots.—Pilots for Hinatuan passage can be obtained at Surigao (page 613) and Cantilan (page 605). In case of necessity vessels can anchor off Surigao to wait for a favourable wind and tide.

Chart 3810.

South-eastern approach to Hinatuan passage.—Coast.—Light.—Cauit (Kauit) point is the north-eastern extremity of a wooded promontory formed by a spur of the eastern mountain chain of Mindanao, and lies about 55 miles south-eastward of Bilaa point, the northern extremity of the island. It is about 450 feet ($137^{m}2$) high, and steep-to on the northern side. On the northern side of the promontory there are some rocks, about 30 feet ($9^{m}1$) high, lying close offshore, from half a mile to 1½ miles westward of the point. The eastern side of the point is fringed by a reef, which extends about 6 cables offshore.

Off-lying bank. — Cauit (Kauit) bank, with a least depth of 8 fathoms ($14^{m}6$) over it, rock, lies from about 2¾ to 4 miles north-eastward of Cauit point. The channel between the south-western end of the bank and the reef fringing Cauit point is deep and clear of dangers.

A light is exhibited, at an elevation of 55 feet ($16^{m}8$), from a white concrete beacon, on Cauit point (*Lat. 9° 18′ N., Long. 126° 12′ E.*).

Lanuza bay.—Dangers.—Lanuza bay is entered between Cauit point and Capungan (Kapunuypugan) point, 14½ miles west-north-westward. From Cauit point to one mile north-eastward of the mouth of Lanuza river, which discharges into the head of the bay, 10 miles south-westward, the shore is bold with black rocky cliffs the remainder of the shore consists of a dark sandy beach.

The only detached danger on the eastern side of the bay is a shoal, with a least depth of one fathom ($1^{m}8$) over it, lying 2¾ miles north-eastward of Lanuza village at the head of the bay, and about half a mile offshore.

Between Cauit point and Lanuza village the mountains come close to the coast, and are steep and wooded. About 6 miles north-eastward of Lanuza, is a prominent shoulder of the mountain range, 1,080 feet ($329^{m}2$) high, about half a mile inland; from this shoulder the range runs southward, and there are hills only of moderate elevation on the remainder of the promontory ending in Cauit point. At the villages of Caridad and Nusia, situated 7½ and 5 miles, respectively, north-eastward of Lanuza, there are sandy beaches.

Lanuza village which stands on the eastern side of the mouth of the

Charts 943, 1263.

Chart 3810.

river of the same name, may be identified by a hill, 550 feet (167$^{\text{m}}$6) high, about a quarter of a mile southward of it, which is the westernmost hill in this vicinity. The valley between Lanuza river and Cantilan (Kantilan) river, which discharges 7¾ miles north-westward, is intersected by a number of waterways, through which small boats can pass from Lanuza to the town of Cantilan.

Suyatun river discharges into Lanuza bay, 5¾ miles north-westward of Lanuza village. Its bar is very shallow, but can be crossed by a pulling boat at low water in a calm sea.

The town of Cantilan (Kantilan) stands on the western side of the mouth of the river of the same name. Steamers call here occasionally and usually anchor north-north-eastward of the town, in a depth of 7 fathoms (12$^{\text{m}}$8). Vessels approaching this anchorage should pass close southward of Unamao island and not attempt to pass inside the Cantilan shoals. The bar of Cantilan river is very shallow; pulling boats are unable to enter at low water. The sandy point through which the river discharges is fringed by a reef which dries, extending about three-quarters of a mile offshore.

Off-lying islands and dangers.—Cantilan shoals are a group of shoals, with depths of from 4 feet to 4¾ fathoms (1$^{\text{m}}$2 to 8$^{\text{m}}$7) over them, lying from one to 2¼ miles from the mouth of Cantilan river.

Capungan point, the northern extremity of Capungan peninsula, is fringed by a steep-to reef which extends about three-quarters of a cable offshore. Capungan peninsula is about 450 feet (137$^{\text{m}}$2) high in the western part, and is connected with Mindanao by a low isthmus about half a mile wide, on the eastern side of which is Consuelo village.

Unamao island (*Lat. 9° 23′ N., Long. 126° 00′ E.*), about 400 feet (121$^{\text{m}}$9) high, and wooded, has four distinct peaks, and lies about half a mile from the eastern side of the southern part of Capungan peninsula. The eastern side of the island is steep-to; the western side is fringed by a reef, on which there are a number of high rocks. A channel, about a quarter of a mile wide, with a depth of 5¼ fathoms (9$^{\text{m}}$6) in the middle, lies between the reef extending from Capungan peninsula and that on which Unamao island lies.

A shoal, which dries, lies about three-quarters of a mile north-eastward of Unamao island. About half a mile north-westward of this shoal there is a 5¼ fathom (9$^{\text{m}}$6) patch, and the same distance north-north-eastward there is a 3-fathom (5$^{\text{m}}$5) patch. A shoal, with a depth of 3½ fathoms (6$^{\text{m}}$4) over it, lies about 2 miles eastward of the south-eastern extremity of Unamao island.

Chart 3826.

General island is the largest of a group of three islands lying off Capungan point; it lies north-eastward of the point, being separated by a channel about 4 cables wide, and deep, except for a rock, over which there is a depth of 3 feet (0$^{\text{m}}$9), lying in the middle of the north-western end. The island is 792 feet (241$^{\text{m}}$4) high in the northern part, where the bluffs are noticeable from eastward or westward. From near the middle of the southern side a small peninsula extends about three-quarters of a mile southward, and forms a bay on either side of it. The western bay, known as General island anchorage, is fringed by reefs; the eastern bay is encumbered with reefs and is of no value to shipping.

General island anchorage affords good anchorage for small vessels

Charts 943, 1263.

Chart 3826.

with local knowledge, sheltered from all winds, in a depth of 14 fathoms (25m6), mud, in the middle of the bay. The village of Buenavista stands at the head of the bay. The eastern entrance point is steep-to; the western entrance point is marked by a prominent rock on the shore reef.

Ramilette rock, 57 feet (17m4) high, lies about 4 cables north-westward of the south-western extremity of General island. It is steep-to and there is a deep channel between it and the western side of the island. A rock, with a depth of 3 feet (0m9) over it, and steep-to, lies about 4 cables southward of Ramilette rock.

Auqui (Auki) island, the easternmost of the General island group, is 337 feet (102m7) high, and lies about 1¾ miles south-eastward of General island. The south-western extremity of the island is steep-to; the other sides are fringed by reefs which extend about half a mile northward from it. Between General and Auqui islands there is much foul ground.

Triton rocks lie 1¼ miles north-north-westward of Auqui island. The northern rock, 15 feet (4m6) high, marks the northern limit of the foul ground between General and Auqui islands.

Whale rock, about 4½ miles north-north-eastward of Triton rocks, is a black rock, 12 feet (3m7) high, with foul ground extending 1½ cables from it. A shoal, with a depth of 28 feet (8m5) over it, lies about 4¼ cables south-eastward of Whale rock.

Carrascal bay. — Islands and dangers. — Carrascal (Karraskal) bay, entered between Capungan point (*Lat. 9° 24′ N., Long. 125° 59′ E.*) and the south-eastern side of Tugas peninsula, about 3 miles north-westward, is divided into two parts by Gorda point, the northern extremity of a small peninsula 3¼ miles west-south-westward of Capungan point, extending from the head of the bay. Several detached shoals, with depths of from one foot to 3 fathoms (0m3 to 5m5) over them, lie from 3 to 5 cables from the eastern shore of the bay; the outer one, with a depth of about 4 feet (1m2) over it, lies about half a mile westward of Capungan point.

Gorda point, 170 feet (51m8) high, is fringed by a reef which extends a quarter of a mile eastward and fringes the shore of the eastern part of the bay as far as Capungan point. Carrascal (Karraskal) village stands on the western side of the entrance to Carrascal river, which discharges into the head of the eastern part of the bay. The western part of Carrascal bay is encumbered by an extensive reef, which dries, and on which lie four islands, of which Ludguron, 310 feet (94m5) high, and Puyu, 100 feet (30m5) high, are the largest, extending as far eastward as 1½ miles north-eastward of Gorda point and nearly 2 miles from the southern shore. A shoal, with a depth of 4 feet (1m2) over it, lies between the northern side of Ludguron island and the north-western shore of the bay, and a shoal, with a depth of 9 feet (2m7) over it, lies about 8 cables northward of the western extremity of Ludguron island.

A tortuous channel between the reefs leads to Adlay (Adlai) village, about 2 miles west-north-westward of Gorda point.

The usual anchorage in Carrascal bay for vessels with local knowledge is about three-quarters of a mile northward of Carrascal church, in a depth of 10 or 12 fathoms (18m3 or 21m9).

Coast.—The eastern side of Tugas peninsula is fringed by a narrow

Charts 3810, 943, 1263.

Chart 3826.

reef, and a reef, which partly dries, extends half a mile south-westward into Carrascal bay, north-westward of which vessels with local knowledge may obtain sheltered anchorage, in a depth of about 17 fathoms ($31^{m}1$). A shoal, with a least depth of 22 feet ($6^{m}7$) over it, lies about half a mile from the south-eastern side of Tugas peninsula, and about 2½ miles southward of Tugas point, its northern extremity.

South-eastern end of Hinatuan passage.—Islets and dangers.—Light.—The south-eastern entrance to Hinatuan passage lies between Tugas point and Dahakit point, the southern extremity of Bucas Grande island, about 5 miles north-north-westward.

Tugas peninsula, extending northward from the north-eastern side of Mindanao, is 521 feet ($158^{m}8$) high and is connected to it by an isthmus less than a quarter of a mile wide and 83 feet ($25^{m}3$) high. Tugas point (*Lat. 9° 29′ N., Long. 125° 57′ E.*) terminates in a cliff, 79 feet ($24^{m}1$) high, half a mile southward of which the land rises to an elevation of about 300 feet ($91^{m}4$). It is fringed by a steep-to reef, which extends about a quarter of a mile north-westward.

Dahikan bay, entered between the north-western point of Tugas peninsula and Kaba point, about 2½ miles north-westward, is divided into two arms by a narrow point extending from Tugas peninsula, from which a reef extends about 3½ cables northward. The shores of the bay are rocky and fringed with reefs, but red soil, washed down from the hills, has formed beaches in all the small coves. Kaba point is steep and rocky, and about half a mile south-eastward of it the land rises to an elevation of 405 feet ($123^{m}4$). A steep-to reef extends about 3½ cables north-westward from Kaba point, and another reef extends about half a mile from the western shore of the bay about three-quarters of a mile south-eastward of the same point.

A shoal, with a depth of 7 feet ($2^{m}1$) over it, coral and white sand, lies in the middle of the entrance, about three-quarters of a mile northward of the point dividing the bay; the sea breaks heavily over this shoal during the North-east monsoon. A shoal, with a depth of 34 feet ($10^{m}4$) over it, lies about 1¼ miles north-westward of Tugas point.

Anchorage may be obtained by vessels with local knowledge in the eastern arm of Dahikan bay, sheltered during the North-east monsoon, but care should be taken to avoid a 2-fathom ($3^{m}7$) patch about 4 cables north-eastward of the western entrance point, and the shoal spit, with a depth of 10 feet ($3^{m}0$) over its eastern end, extending from the western side of the eastern arm.

Hinadkaban bay is entered between Kaba point and a point about 2 miles west-north-westward. Its shores are fringed by reefs, which, near the head, extend about half a mile offshore. Anchorage may be obtained by small vessels with local knowledge, partially sheltered from the North-east monsoon, westward of Kaba point.

About one mile southward of the head of Hinadkaban bay are the Red hills, which follow the coast to Tugas point. They are a striking feature in this locality, being nearly bare and composed of bright red soil and in places red rock, which is rapidly crumbling where exposed to the weather. The lower slopes in many places are covered with a dense growth of scrub.

Amaga islet, 169 feet ($51^{m}5$) high to the tops of the trees, lies in the middle of the channel between Mindanao and Bucas Grande island, about 2½ miles northward of Kaba point. It is composed of jagged

Charts 3810, 943, 1263.

Chart 3826.

coral, much underworn, making landing impossible; it is steep-to and can be passed on either side.

About half a mile eastward of the extremity of Dahakit point, the southern coast of Bucas Grande island rises to an elevation of about 330 feet (100$^{\text{m}}$6). The bay northward of Dahakit point is encumbered with islets and reefs, of which the Dahikan islets and Bobon islet are the largest.

A light is exhibited, at an elevation of 100 feet (30$^{\text{m}}$5), from a white concrete pillar, on Dahakit point.

Sohutan bay is entered between a point about 2¾ miles north-westward of Dahakit point and Nakiauit point, the south-western extremity of Bucas Grande island, about 1¼ miles north-westward. From the south-eastern entrance point a reef, on which there are several large rocks, extends 4½ cables north-westward. An island, 186 feet (56$^{\text{m}}$7) high, lies close westward of this point, and a 27-foot (8$^{\text{m}}$2) patch lies about 3¾ cables westward of the point. The outer rock, lying on the northern edge of the reef, is 107 feet (32$^{\text{m}}$6) high and may be rounded close-to. Eastward of this reef there is good protected anchorage for vessels with local knowledge, in a depth of 23 fathoms (42$^{\text{m}}$1), about a quarter of a mile from the head of the bay. In approaching this anchorage from southward the 107-foot (32$^{\text{m}}$6) rock should not be brought to bear less than 047°, in order to pass outside all dangers off the south-eastern entrance point. Sohutan inlet, at the head of Sohutan bay, is of no value to shipping, there being a depth of only 1½ feet (0$^{\text{m}}$5) at the entrance.

Nakiauit point (*Lat. 9° 37′ N., Long. 125° 53′ E.*) is about 200 feet (61$^{\text{m}}$0) high. Two shoals, each with a depth of 2½ fathoms (4$^{\text{m}}$6) over it, lie a quarter and half a mile, respectively, westward of the point; they cannot be distinguished until directly over them. A one-fathom (1$^{\text{m}}$8) patch lies half a mile south-eastward of the point.

Lang islets are a group of small rocky islets lying from half a mile to one mile from the Mindanao coast, about 2¾ miles north-westward of Kaba point. The largest islet is 132 feet (40$^{\text{m}}$2) high, and the southern of the two south-eastern islets, is 78 feet (23$^{\text{m}}$8) high to the tops of the trees. A shoal, with a depth of 33 feet (10$^{\text{m}}$1) over it, lies 6 cables northward of the largest of the Lang islets.

Telegraph islet, 220 feet (67$^{\text{m}}$1) high, and two other islets lie on the coastal reef of Mindanao about 1¼ miles westward of the largest of the Lang islets.

Hegapit river, which discharges on the north-eastern coast of Mindanao, about one mile westward of Telegraph islet, is navigable by small boats to half a mile above Taganeto village, which stands on the west bank about one cable from its mouth. An islet, 152 feet (46$^{\text{m}}$3) high, lies on the coastal reef about three-quarters of a mile eastward of the entrance to the Hegapit river.

Aling islet, about half a mile north-westward of Telegraph islet and 6½ cables offshore, is about 10 feet (3$^{\text{m}}$0) high, wooded and composed of white sand which is always visible, making it easy to identify, all the other islets in the vicinity being of rough, eroded, coral rock. It lies on the southern part of an extensive drying reef which extends about 6 cables north-westward from it. A 2-fathom (3$^{\text{m}}$7) patch lies about 6 cables eastward of the islet.

Male islet, 104 feet (31$^{\text{m}}$7) high, lies on the southern end of a reef

Charts 3810, 943, 1263.

which dries, extending one mile north-north-westward from a position half a mile westward of Aling islet and a similar distance from the coast of Mindanao. There are several shoals between Male and Aling islets and the coast, and although there is a deep channel between them and the coast it is only one cable wide in one place. A 27-foot (8^m2) patch lies 6½ cables north-westward of Male islet, and a reef lies about 1¼ miles westward of the islet and half a mile offshore; this reef is marked by breakers, and a few rocks on it dry. A 39-foot (11^m9) patch lies about 3½ cables west-north-westward of the reef.

The western side of Bucas Grande island is indented by a number of small bays, mostly too deep to afford anchorage. The coast is fringed by steep-to reefs, nowhere extending more than half a mile offshore.

Kanlanuk bay, on the western side of Bucas Grande island, is entered about 3 miles north-north-eastward of Nakiauit point; its shores are fringed by a reef, which dries. A reef extends half a mile north-westward from the southern entrance point of the bay. Anchorage may be obtained by vessels with local knowledge, in a depth of 24 fathoms (43^m9), about 4 cables northward of Pamosaingan village, which stands at the head of the bay.

Manaol point, about 6½ miles northward of Nakiauit point, is high, and fringed by a very narrow, steep-to reef.

Southern side of Hinatuan passage.—Bagong islet, 146 feet (44^m5) high, lies on the northern edge of a reef which extends half a mile southward from it, about 2¾ miles west-north-westward of Male islet. Between this reef and the coast of Mindanao are some shoals, which dry. The northern side of the islet may be rounded at a distance of one cable. Pagbuy (Pagbui) rocks, from 15 to 34 feet (4^m6 to 10^m4) high, lie about 6 cables northward of Bagong islet; they are fairly steep-to on their northern side. About 2 cables westward of the reef surrounding the rocks is a patch which dries.

Lapinigan island (*Lat. 9° 35′ N., Long. 125° 46′ E.*), 224 feet (68^m3) high, and covered with grass and scattered trees, fronts Candos (Kandos) bay, which is formed by an elbow in the coast eastward of Claver point, situated about 3 miles west-north-westward of Bagong islet. Lapinigan island is fringed with reefs, which dry, extending from 2 to 2½ cables offshore. About 3½ cables south-eastward of the island is a shoal, which dries. Good sheltered anchorage may be obtained by vessels with local knowledge westward or southward of Lapinigan island, in depths of from 6 to 10 fathoms (11^m0 to 18^m3), mud.

Candos bay is fringed with reefs which extend as much as half a mile offshore, narrowing the channel between Lapinigan island and Mindanao to about 2½ cables.

Claver point is 106 feet (32^m3) high, and is the eastern entrance point of Becebos bay. Claver river, with the village of the same name on its east bank, about half a mile from its mouth, discharges on the western side of the point. Between Claver point and the mouth of Bacuag (Bakuag) river, about 5 miles westward, besides Claver river there are Magallanes, Gigaquit (Gigakit), and Alambique rivers, all of which have shallow bars and may be entered by small boats at low water. Magallanes river discharges about 1¼ miles westward of Claver river. Gigaquit and Alambique rivers discharge through the same mouth about 2 miles west-north-westward of Magallanes river,

Chart 3826.

and are fronted by a bank, with depths of 3 feet ($0^{m}9$) over it, extending three-quarters of a mile offshore. Gigaquit (Gigakit) village stands on the southern bank of the river of the same name, about one mile from its mouth. It is fronted by a long sand spit extending from Byby island, which forms the northern bank of the river. Byby island is low and flat, and has a grove of coconut trees on it, but it is composed mostly of a mangrove and nipa swamp.

Cabgan (Kabgan) island, 178 feet ($54^{m}2$) high, lies about half a mile north-eastward of the northern extremity of Byby island. It is fringed by a reef which extends about 4 cables north-westward from it and a quarter of a mile northward, and is usually marked by breakers. A rocky shoal, with a depth of 21 feet ($6^{m}4$) over it, lies 6 cables north-north-eastward of the island.

Between the town of Bacuag (Bakuag), which stands in the middle of a large coconut district, about one mile west-north-westward of the mouth of Bacuag river, and the town of Placer, about 3½ miles farther north-westward, a range of densely wooded hills rises from the coast. A spit, with a depth of 9 feet ($2^{m}7$) at its outer end, extends about half a mile offshore, close north-westward of Bacuag, and on it is Puyo rock, which is prominent.

Close northward of the point on which the town of Placer stands is a small harbour formed by an extensive reef, which dries, extending 6½ cables north-eastward from the point, and on which there is an islet. A shoal, with a depth of 3 feet ($0^{m}9$) over it, lies nearly in the middle of the harbour about a quarter of a mile northward of the point. There is a small jetty with a depth of 13 feet ($4^{m}0$) at its head. Small vessels with local knowledge may obtain sheltered anchorage in the harbour, in depths of from 6 to 9 fathoms ($11^{m}0$ to $16^{m}5$), mud.

Canal bay, entered between Cog point (*Lat. 9° 41′ N., Long. 125° 36′ E.*), situated about one mile northward of Placer, and Sampetan point, the southern extremity of Masapelid island, about 3 miles eastward, is encumbered in its northern part by several islets and dangers. Bobon village stands on the western shore about 1¼ miles north-westward of Cog point. Taganaan village, about three-quarters of a mile north-north-westward of Bobon village, stands at the mouth of the river of the same name, which discharges into the southern end of Taganaan Estero, a narrow passage leading from the western side of Canal bay to the head of Panag bay (page 613).

Dinago and Opong islands, situated about 4 cables and 1¼ miles, respectively, northward of Cog point, are 416 and 402 feet ($126^{m}8$ and $122^{m}5$) high; they are of jagged coral, much eroded at the water line, giving them a mushroom appearance; they are covered with vegetation and may be readily identified. About 2 cables eastward of Dinago island is an islet, 125 feet ($38^{m}1$) high. A rock, awash, and a shoal, with a depth of 3 feet ($0^{m}9$) over it, lie about 6 cables eastward and north-eastward, respectively, of the north-eastern extremity of Dinago island.

Masapelid island is 684 feet ($208^{m}5$) high near the southern end. The western part is wooded, and has many small peaks; the north-eastern part is covered with grass and scattered trees; in the southern part, on the western side, there is a densely wooded ridge, and on the eastern side there is grass and a number of dead trees. A reef, which dries, lies half a mile south-eastward of Sampetan point. The village

Charts 3810, 943, 1263.

of Lakandola is situated on the western side of the island near the southern end.

Off-lying islands and dangers.—Hinatuan rock (*Lat. 9° 41′ N., Long. 125° 46′ E.*), with a depth of 21 feet (6^m4) over it, and steep-to, lies in the fairway of Hinatuan passage, about 6 miles north-north-eastward of Claver point.

Nagubat islet, 172 feet (52^m4) high, lies near the middle of a narrow reef, about 3½ miles east-south-eastward of Sampetan point. Dijut (Dihut) rock, 38 feet (11^m6) high, with a single coconut tree on it, stands on the same reef, and about 6 cables northward of Nagubat islet. Dijut rock is surrounded by several smaller rocks and is prominent. There is a channel, with a depth of 21 feet (6^m4) across the reef, midway between Nagubat islet and Dijut rock.

Isa reef, with a depth of 7 feet (2^m1) over it, lies about 1¾ miles east-south-eastward of Sampetan point.

Bonga island, 325 feet (99^m1) high, and densely wooded, lies one mile north-eastward of Sampetan point; it is fringed by a reef, which extends about 4 cables south-south-eastward from it. A 3-foot (0^m9) patch lies about 2 cables north-westward of the island.

Mahaba island lies close to the eastern side of Masapelid island, from which it is separated by a narrow, deep channel, the southern and better entrance to which is marked by two islets, one, 74 feet (22^m6) high, on the reef fringing the eastern side of Masapelid island, and the other, 53 feet (16^m2) high, on the edge of the reef extending from the southern side of Mahaba island. Mahaba island is 277 feet (84^m4) high, wooded on top, with coconut trees near the eastern coast. It is fringed by reefs, which, on the north-eastern and south-eastern sides, extend from a quarter to half a mile offshore.

Talavera island, 605 feet (184^m4) high, and covered with coconut trees and grass, lies 1½ miles north-eastward of Masapelid island; it is fringed by a narrow, steep-to reef, which extends a quarter of a mile southward from its south-western point, and surrounds a sand islet. The island is cultivated, and on its northern extremity is Talavera village. A fairly good anchorage may be obtained by small vessels with local knowledge at the head of a small bay in the south-western part of the island, in a depth of about 24 fathoms (43^m9), mud.

Banug islet (*Lat. 9° 46′ N., Long. 125° 41′ E.*) lies on the southern side of a reef which dries, about 3 cables north-westward of the northern extremity of Talavera island, with a deep channel, clear of dangers, about one cable wide, between them. The island has two hills, the eastern of which is 130 feet (39^m6) high, joined by a low sandy isthmus, covered with palm trees.

Hinatuan island is separated from the north-eastern side of Talavera island by Banug strait, which, between Banug islet and the south-western side of Hinatuan island, is about half a mile wide, and clear of dangers in the fairway. The island is fringed by a narrow steep-to reef, which extends 2½ cables northward from the north-western extremity. From a distance it appears like two islands, the large southern part being joined to the northern part by a narrow isthmus only about 30 feet (9^m1) high. The southern part is 1,135 feet (346^m0) high, and is covered with a thin growth, through which patches of bright red soil are seen. The northern part is 606 feet (184^m7) high, has vertical cliffs of dark stone, and is heavily wooded.

Charts 3810, 943, 1263.

Chart 3826.

Caye (Kaye) island, 269 feet ($82^{m}0$) high to the tops of the trees, lies about half a mile northward of Masapelid island. Its western side is composed of mangrove, and on the eastern side there is a sandy beach. There are very narrow, deep channels between it and Masapelid island, and between it and Bilabid island, about half a mile northward of it.

Bilabid island is 298 feet ($90^{m}8$) high to the tops of the trees; the eastern part is covered mostly with grass and scattered trees, but has a prominent clump of green trees on its summit.

Bayagnan island, separated from the north-eastern side of Bilabid island by a narrow foul channel, has two low passes, 15 or 20 feet ($4^{m}6$ or $6^{m}1$) high, which divide the island into three parts. Mount Telegraph, a sharp peak in the south-eastern part, is covered with tall green trees, is 827 feet ($252^{m}1$) high, and is a prominent landmark. The island is fringed by reefs which extend 6½ cables from the north-eastern side and enclose a number of rocks and islets. Dayan reef, situated close westward of the northern end of the island about half a mile south-westward of Bitogan point, the northern extremity, has on it a group of rocks about 7 feet ($2^{m}1$) high; between the reef and the island is a very narrow deep channel, in which are violent tidal whirlpools. The settlement of San Jose is situated on the point of that name, the south-eastern extremity of the island.

Sugbu islet, 214 feet ($65^{m}2$) high and wooded, lies on the outer part of the reef which extends from the north-eastern side of Bayagnan island. Diutay islet lies on the inner part of this reef. Sagasae islet lies on the reef extending 6½ cables south-eastward from the south-eastern extremity of Bayagnan island. The north-eastern part of this islet is wooded and about 175 feet ($53^{m}3$) high to the tops of the trees, the rest is covered with grass and palms. The channel between it and Talavera island is about 2½ cables wide between the reefs on each side, deep and clear of dangers.

Masapelid passage.—Masapelid passage leads northward from the northern end of Canal bay between Masapelid, Bilabid and Bayagnan islands, on the east, and Condona (Kondona) island, 284 feet ($86^{m}6$) high, Maanoc (Maanok) island, 161 feet ($49^{m}1$) high, and Lamagon island, on the west. It can only be used by small vessels with local knowledge.

Western end of Hinatuan passage.—Islands and dangers.—Light.—Between Canal bay and Surigao, about 4 miles east-south-eastward of Bilaa point (*Lat. 9° 49′ N.*, *Long. 125° 26′ E.*), the southern entrance point of the western end of Hinatuan passage, the coast of Mindanao is bordered by mangroves which extend inland for a distance of from one to 2 miles; it is fronted by a number of islands, which are composed mostly of mangroves, lying so close to the coast as to appear part of it; their sides facing Hinatuan passage are mostly steep-to. The passages between these islands and the coast of Mindanao, and between each other are navigable only by small craft with local knowledge. The hills nearest the coast are mostly covered with coconut trees and grass, and are detached from the mountains, which are densely wooded.

Nonoc island, on the northern side of Hinatuan passage, has been described on page 595.

Doot islet lies close to the south-western side of Nonoc island, being

Charts 3810, 943, 1263.

Chart 3826.

separated by a narrow channel, bordered with mangroves. The southern half of the island is covered with mangroves, while the northern half is high, with three grassy wooded hills, the highest having an elevation of 190 feet ($57^{m}9$). A reef extends from the western side, reaching almost to the village of Nonoc, at the south-western extremity of the island of that name, where it ends in several rocks above water. There is a deep channel between the rocks and the village, and small vessels with local knowledge may obtain an anchorage just inside them. The channel between the south-western side of Doot islet and Rasa islet is deep and clear of dangers, but its use is not recommended owing to the heavy tide-rips, whirlpools, and strong tidal streams in it. There is scarcely any slack water in this channel, the stream changing very quickly.

Rasa islet lies on an extensive steep-to reef, which partly dries, about 3 cables south-south-westward of Doot islet. It is composed mainly of mangroves, but there is a hillock, about 25 feet ($7^{m}6$) high, in the middle, and a sandy beach on the north-eastern side. The reef on which the islet lies extends about three-quarters of a mile from the north-western side; the north-eastern side is steep-to.

A light is exhibited, at an elevation of 10 feet ($3^{m}0$), from a square concrete tower, on the southern edge of the reef extending southward from Rasa islet.

On the southern side of Hinatuan passage, about 1½ miles southward of Rasa islet is Lapinig islet, covered with mangroves, and southward of which is Panag bay, entered between Lamagon island and some islets one mile westward. A reef, awash, lies near the middle of the entrance. Anchorage may be obtained in the bay by vessels with local knowledge, in a depth of 20 fathoms ($36^{m}6$), sand, about half a mile southward of the western entrance point; there appears to be no tidal stream in this bay. It is the only good anchorage in the vicinity.

About one mile westward of Lapinig islet is Load island, 92 feet ($28^{m}0$) high, and close northward of the latter is Kabo island, 110 feet ($33^{m}5$) high; both islands are bordered with mangrove.

Kabo reef, with a depth of 15 feet ($4^{m}6$) over it, lies on the southern side of the fairway of Hinatuan passage, three-quarters of a mile north-westward of the northern extremity of Kabo island.

Close westward of Kabo and Load islands is a mangrove-covered island lying close off the coast of Mindanao, between which and a point 1¾ miles westward is Bilanbilan bay. There are several shoals in the entrance, the outer of which, with a depth of about one foot ($0^{m}3$) over it, lies about 6 cables from the eastern shore.

Chart 962, plan of Port Surigao.

Surigao.—Light.—Dangers.—Surigao (*Lat. 9° 47′ N., Long. 125° 30′ E.*), the capital of the province of the same name, stands on low land on the right bank and at the mouth of Surigao river. It contains a number of large buildings and is prominent. It is a place of considerable commercial importance, most of the trade of eastern Mindanao passing through here. The wharves and warehouses are at the village of Bilanbilan, about half a mile south-eastward of Surigao, with which it is connected by a good road. In 1937, the population of Surigao was estimated to be about 3,000.

A light is exhibited, at an elevation of 22 feet ($6^{m}7$), from a square concrete tower, on the edge of the coastal reef, about 6½ cables south-

Charts 3810, 943, 1263.

Chart 962, plan of Port Surigao.

eastward of the eastern entrance point of Surigao river. It was reported, in **1948**, that there was less water off the lighthouse.

A shoal, with a depth of 2¼ fathoms ($4^{m}1$) over it, lies about 2¾ cables southward of the light-structure, and a sunken rock lies about a quarter of a cable farther southward.

The largest wharf at Bilanbilan had, in **1938**, a depth of 21 feet ($6^{m}4$) at its south-western end, with less depth north-eastward. There is a small jetty at the north-eastern end of the wharf, awash at low water. Vessels usually drop their bow and stern anchors and haul in to the wharf according to draught.

There is regular communication by steamer with Manila and Cebu.

Anchorage.—Good anchorage may be obtained by vessels not requiring to go alongside the wharves at Bilanbilan, in depths of from 14 to 16 fathoms ($25^{m}6$ to $29^{m}3$) sand, about a quarter of a mile eastward or south-eastward of the light-structure.

Climatic table.—*See* page 37.

Chart 3826.

Western entrance to Hinatuan passage. — Islands and dangers.—Surigao river, which discharges on the north-western side of the town of Surigao, has a depth of about one foot ($0^{m}3$) on its bar. The ruins of an iron bridge near the mouth prevents large boats from entering. About 1¼ miles above the entrance the river divides into two branches; the larger branch, called the Tomanday, flows northward, forming Bingad island between them. Tomanday river has a depth of about one foot ($0^{m}3$) on its bar; at high water boats drawing not more than 5 feet ($1^{m}5$) can enter and ascend the river for about 1½ miles.

The coast between the mouth of Surigao river and Bilaa point, for the first two miles, consists of a narrow sandy beach bordered with coconut trees, inside which are mangroves and low land. The remainder of the coast is mostly stony, with sandy beaches in the small coves which indent the coast, and fringed by coral heads for a distance of from a quarter to half a cable offshore, outside which the depths rapidly increase.

Basol island, 25 feet ($7^{m}6$) high, lies about 2¾ miles east-north-eastward of Bilaa point. The eastern part of the island is covered with coconut trees and has a sandy beach; the western part, which is higher than the eastern, is wooded, with a rocky coast. The island is fringed by a steep-to reef, which, on the north-western side, extends 2 cables offshore. A 6-fathom ($11^{m}0$) patch, with an 8-fathom ($14^{m}6$) patch a quarter of a mile westward of it, lies about 6 cables north-westward of Basol island and a 33-foot ($10^{m}1$) patch lies about 3 cables south-eastward of the island.

Bilaa point (*Lat. 9° 49′ N., Long. 125° 26′ E.*) is the termination of the range of mountains which traverses the east coast of Mindanao; it is of dark rock, and is fringed by a narrow steep-to reef.

Bilaa shoal, composed of sand and dark coral heads with a least depth of 2 fathoms ($3^{m}7$) over it, lies about three-quarters of a mile northward of Bilaa point, from which it is separated by a deep channel half a mile wide; vessels using this channel should pass between a quarter and half a mile from the coast. During the South-west monsoon, anchorage may be obtained by vessels with local knowledge on

Charts 3810, 943, 1263.

Chart 3826.

the slope of this shoal, sheltered from the tidal streams. The position of the shoal is usually indicated by tide-rips.

Hikdop island lies on the northern side of Hinatuan passage, with Panam point, its south-eastern extremity, 4¼ miles north-north-westward of Rasa islet. It is rugged and 994 feet ($303^{m}0$) high to the tops of the trees. The northern part is mostly covered with coconut trees and grass; the southern part is mostly wooded. The island is generally fringed by a narrow steep-to reef, which extends about 4 cables eastward from Panam point, with a depth 21 feet ($6^{m}4$) near its outer end. There are several villages, of which Buenavista, lying on the south-western side, is the most important. The channel between Hikdop island and Sibale island (page 594) is about one mile wide and can be safely navigated by keeping in the middle.

Onate rock is a small coral reef showing several black rocks, one of which dries about 4 feet ($1^{m}2$), lying one mile south-westward of the middle of the south-western coast of Hikdop island.

Beelzebub reef, with a least depth of 15 feet ($4^{m}6$) over it, lies about half a mile westward of Onate rock, with a narrow deep channel between them.

Danaon island lies 8½ cables westward of Agukan point, the northern extremity of Hikdop island. It is low, flat and sandy on its eastern side, and covered with coconut trees, and there is a white coral sandy beach at Danaon village on this side; the remainder of the island is rocky and wooded, being 152 feet ($46^{m}3$) high to the tops of the trees. The east coast is steep-to, but the other coasts are fringed with a reef, extending nearly 4 cables off the southern side, and covered with boulders. A rock, 4 feet ($1^{m}2$) high, lies on a detached coral reef nearly half a mile north-eastward of the island.

Satan rock (*Lat. 9° 56′ N., Long. 125° 28′ E.*), about 1½ miles westward of Danaon island, is a conical, steep-to, black rock above water. It may be passed fairly close-to on either side.

Sumilon island, about 157 feet ($47^{m}8$) high to the tops of the trees, lies 2¾ miles west-south-westward of Danaon island. A sand spit, on which are two prominent rocks, extends about a quarter of a mile from the south-eastern end of the island. The outer rock is covered with bushes, and the other is bare. One of these rocks is 27 feet ($8^{m}2$) high.

Tidal streams.—The tidal streams in Hinatuan passage run at a considerable rate, and the tide-rips and whirlpools are very marked in some parts. The maximum rate is about 7 knots, being usually strongest southward and just westward of Rasa islet. In the latter area, and in the vicinity of Kabo reef the tide-rips during the strength of the north-west-going stream are very marked. There are tide-rips and whirlpools in some parts of the channel from abreast Hinatuan island to a short distance westward of Kabo reef.

The time of high water slack generally occurs abreast of Rasa islet about 40 minutes before high water at Surigao while the low water slack generally occurs about 50 minutes before low water at Surigao, although, at times, the times of both high and low water slack will vary from the foregoing by as much as 40 or 50 minutes.

Directions for Hinatuan passage.—A vessel approaching the south-eastern entrance to Hinatuan passage may pass on either side of Whale rock, which is steep-to, and on either side of Amaga islet;

Charts 3810, 943, 1263.

Chart 3826.

thence she should steer to pass well clear of Hinatuan rock, and thence for the middle of Banug strait, steering about 317° through it; then she should keep in mid-channel round Bitogan point, the northern extremity of Bayagnan island, and round the light-structure southward of Rasa islet at a distance of half to three-quarters of a mile; then she should steer north-westward until Bilaa point bears 272°, when she should steer for it on that bearing, and pass between the point and Basol island.

The vessel may pass eastward and northward of Hinatuan island instead of passing through Banug strait, but the latter is clear of dangers and the tidal streams in it are weaker.

Chart 3810.

EASTERN SIDE OF MINDANAO.—**Coast.**—Between Cauit point (page 604) and Panisaan point, 8½ miles southward, the coast is bordered by a sand and gravel beach as far as Cortes village, about 2 miles southward, thence to Panisaan point it is mostly fringed with mangroves. It is bordered by a reef, which extends from 6 cables off Cauit point, to nearly 1½ miles abreast of Taganauan islet, situated about 4½ miles southward. This reef partly dries and on it are several islets and rocks; there are several breaks in it which afford boat passages to the various villages. The outer edge of the reef is usually marked by breakers and there are several detached reefs which break at all times, about 1¼ miles offshore abreast of Tigao village, 4 miles southward of Cortes. About 1¾ miles south-south-westward of Cortes is Burgos village.

Taganauan islet (*Lat. 9° 14′ N., Long. 126° 12′ E.*), about 60 feet (18$^{\mathrm{m}}$3) high to the tops of the trees and fringed by mangroves, lies on the coastal reef, about half a mile offshore. Close off its eastern side are several islets and rocks, the largest and outer of which is 75 feet (22$^{\mathrm{m}}$9) high to the tops of the trees.

Panisaan point rises steeply from the water's edge. About 2¼ miles westward of it is a dome-shaped mountain, 2,130 feet (649$^{\mathrm{m}}$2) high, which shows up well, but is frequently obscured in cloudy weather.

Current.—A constant south-going current of from one to 2 knots has been experienced between Cauit and Panisaan points.

Anchorage.—Anchorage may be obtained by vessels with local knowledge in fair weather or with westerly winds anywhere along the coast between Cauit and Panisaan points, in depths of from 12 to 20 fathoms (21$^{\mathrm{m}}$9 to 36$^{\mathrm{m}}$6), sand, or sand and rock. Good anchorage for small vessels may be obtained in a break in the reef about 1½ miles southward of Cauit point, in a depth of 8 fathoms (14$^{\mathrm{m}}$6), mud, protected from all winds and seas except from eastward.

Coast.—**Dangers.**—From Panisaan point to a point half a mile southward of the mouth of Paninilan river, 3¼ miles southward, there are nearly vertical cliffs interspersed with sandy beaches, which are fringed with coral extending in some places half a mile offshore; thence to Tandag point, 5½ miles south-south-eastward of Panisaan point, there is a sandy beach. In the bay between the mouth of Paninilan river and Tandag point there are several detached reefs with narrow passages between them, lying from a half to three-quarters of a mile offshore, on which the sea always breaks.

The town of Tandag stands on Tandag point, which is low and flat,

Charts 943, 1263.

Chart 3810.

and may be easily identified by Lenungan island with an islet close eastward of it lying northward of the point, and which front the entrance to Tandag river, which discharges on the western side of the town. It contains a church and is a place of considerable commercial importance, as most of the products of the valleys of the Tandag and Tago rivers are shipped from here. Tandag river has a very shallow bar, but may be entered by a small boat at high water.

Lenungan island, 365 feet ($111^{m}2$) high, steep and densely wooded, lies about half a cable from the west bank of Tandag river mouth, and forms the northern and eastern sides of the channel through which the river flows. The northern and western sides of the island are steep-to. The islet about a quarter of a mile eastward of Lenungan island is 353 feet ($107^{m}6$) high; the reef on which it lies extends about half a mile eastward from it. The opening between the islet and Tandag point is closed by a coral reef. Small vessels with local knowledge can pass through the channel between Lenungan island and the islet eastward of it, and obtain anchorage, in a depth of 5 fathoms ($9^{m}1$), in the middle of a small cove formed by the island and islet and Tandag point; there is a least depth of 5 fathoms ($9^{m}1$) in the entrance channel. There is a mole extending westward from the southern end of the islet, but it can only be used as a boat landing.

Anchorage, sheltered from all winds, except those from north to east, may be obtained by vessels with local knowledge, in depths of from 7 to 10 fathoms ($12^{m}8$ to $18^{m}3$), mud, a quarter of a mile westward of the northern end of Lenungan island.

Off-lying island.—Macangani (Makangani) island, one of the most prominent landmarks in this vicinity, lies on the southern part of a bank about 2½ miles north-north-eastward of Tandag point. It is 260 feet ($79^{m}2$) high, and covered with small trees and brushwood. Two rocks, 85 and 130 feet ($25^{m}9$ and $39^{m}6$) high, lie close off the northern end of the island.

Coast.—Dangers.—A reef, which partly dries, extends from one to 5 cables offshore between Tandag point (*Lat. 9° 05′ N., Long. 126° 12′ E.*) and a point one mile south-eastward; on the reef are several rocks, from 6 to 10 feet ($1^{m}8$ to $3^{m}0$) high. A detached reef, which dries, lies 1½ miles south-eastward of Tandag point and about a mile offshore. From the point one mile south-eastward of Tandag point to the entrance to Magabao cove, 6¾ miles south-eastward, the coast is bordered by a sandy beach.

Tago river, reported to be the largest river in eastern Mindanao, discharges about 5 miles south-eastward of Tandag point. There is a narrow channel across the bar, with a depth of one fathom ($1^{m}8$), but the heavy sea which usually runs on this coast makes it unsafe for any vessel to enter. The great size of the river valley is indicated by the absence of coastal mountains, which, northward and southward, rise abruptly from the coast. The town of Tago stands on the north bank of the river, about three-quarters of a mile from the entrance, and is not visible from seaward. Landing is dangerous on account of the surf. The best landing is at the mouth of Tandag river.

Magabao cove, the shores of which are fringed with reefs, is half a mile wide at its entrance; a 3¾-fathom ($6^{m}9$) patch lies in the middle of the entrance. The north-western entrance point is low; the south-eastern entrance point is high and rocky, and is the first high land on

Charts 943, 1263.

Chart 3810.

the coast south-eastward of Tandag point. The village of La Paz stands about three-quarters of a mile north-westward of the north-western entrance point.

Between Magabao cove and Lambillon point, about 3 miles south-eastward, the coast is high, bold, and rocky, with occasional patches of mangrove, and is fringed by a narrow, steep-to reef, on which there are several rocks. A reef, which breaks in moderate weather, lies about 6 cables north-north-eastward of Lambillon point, and 4 cables offshore. A 6½-fathom (11^{m}9) patch lies about 1¾ miles northward of Lambillon point and 6½ cables offshore.

Caguait (Kaguait) harbour is entered southward of Lambillon point. The northern side of the harbour is high and rocky; the southern entrance point is low and rocky. There is a depth of 7 fathoms (12^{m}8) in the entrance, which is about a quarter of a mile wide; the depths decrease gradually to the head where there is a sandy beach with scattered palm trees. Caguait (Kaguait) village stands on the southern shore of the harbour. Good anchorage, protected from all winds and seas, except those from eastward, may be obtained by small vessels with local knowledge in the harbour according to draught.

From Lambillon point to Umanun point, 5¾ miles southward, the coast is lower than northward of Lambillon point. Close south-eastward of Caguait harbour is a small sandy cove encumbered with reefs. From the eastern entrance point of this cove to the head of Bitaugan bay, a distance of about 2¾ miles southward, the coast is fringed by a reef extending from a quarter to half a mile offshore. About half a mile southward of the eastern entrance point of the cove, the rocky shore ceases and is bordered by mangroves which continue for about 2 miles to the head of Bitaugan bay, where there is a sandy beach. This beach continues for over half a mile southward, where the rocky shore begins again and continues around Umanun point.

Bitaugan bay. — Dangers. — Light. — Bitaugan bay is about 1½ miles wide at its entrance. The head of the bay is shallow, and there are a number of reefs and sunken rocks, which contract the anchorage space. Bitaugan village is situated on the southern shore. An extensive reef, which dries, lies in the entrance to the bay, leaving a channel from 3 to 5 cables wide between its north-western and south-western sides and the coast of Mindanao, where good sheltered anchorage may be obtained by small vessels with local knowledge. Arangasa islands, three in number, lie on this reef. The largest is only a mangrove patch, and lies on the western part of the reef. Arangasa island, on the south-eastern part of the reef, is sandy, and on it there is a coconut grove and other trees, the tops of which are about 80 feet (24^{m}4) high. The third island, about half a cable southward of Arangasa island (*Lat. 8° 53′ N., Long. 126° 20′ E.*), is rocky and covered with brushwood.

An extensive rocky shoal, with a least depth of 1½ fathoms (2^{m}7) over it, on which the sea breaks in moderate weather, lies about 1¼ miles east-south-eastward of Arangasa island. Between this shoal and the reef on which the island lies the depths are irregular, and this channel is not recommended.

A rock, with a depth of 3 fathoms (5^{m}5) over it, and a reef, which dries, lie in the southern approach to Bitaugan bay, 6½ cables south-eastward and one mile south-south-eastward, respectively, of the

Charts 943, 1263.

Chart 3810.

southern entrance point. The reef, on which the sea constantly breaks, lies with its outer edge 4½ cables offshore.

A light is exhibited, at an elevation of 36 feet ($11^{m}0$), from a white concrete tower, on the eastern side of Arangasa island.

Anchorage.—Directions.—Good sheltered anchorage may be obtained by vessels with local knowledge in Bitaugan bay, in a depth of 12 fathoms ($21^{m}9$), with the southern extremity of Arangasa island bearing 096°, in mid-channel, between the western end of the reef on which the Arangasa islands lie and the south-western shore of the bay, but care should be taken to avoid a 2-fathom ($3^{m}7$) coral patch situated about 14 cables westward of Arangasa lighthouse.

The northern channel into Bitaugan bay is narrow and tortuous, and should not be attempted without local knowledge. If entering by the southern entrance, a vessel should steer for the southern entrance point, on which there is a hill over 200 feet ($61^{m}0$) high, bearing 288°, and pass it at a distance of three-quarters of a cable or one cable and then alter course north-westward for the anchorage.

Coast.—Dangers.—Umanun point is rocky and fringed by a narrow reef. About half a mile within it the land rises to an elevation of 460 feet ($140^{m}2$).

Between Umanun point and Jobo point, about 10 miles south-westward, the coast is much indented by bays, fringed with coral reefs, fronted by a number of dangers, and is intersected by several rivulets.

Santa Cruz bay, immediately south-westward of Umanun point, is about three-quarters of a mile wide at its entrance; its shores are bordered by mangroves, and fringed with reefs which dry. A reef, which dries, lies about 3½ cables south-eastward of Umanun point, and two reefs, which dry, lie within 6½ cables east-north-eastward of the southern entrance point of Santa Cruz bay. Southward of the first-mentioned reef, there is a deep channel, over a quarter of a mile wide, leading into the bay. In the middle of the bay there is a detached reef which dries, which renders the bay useless to shipping.

From the southern entrance point of Santa Cruz bay, the coast, for 4 miles south-westward, is low and rocky, thence to the mouth of Oteiza river, about 5 miles farther, mangrove predominates. Marihatag village stands on the southern side of the river of the same name, which discharges 2 miles south-westward of the southern entrance point of Santa Cruz bay, and which has a very shallow bar; small boats can enter the river at high water and ascend about 3 miles.

A reef, which dries, lies about 8 cables eastward of the mouth of Marihatag river, and close south-eastward of the reef there is a 2¾ fathom ($5^{m}0$) patch. About 3½ cables west-south-westward of the reef there is a rock which breaks, with a deep channel between them.

Marihatag is a port of call for coasting steamers, which usually anchor about half a mile southward of the drying reef eastward of the river, in depths of from 16 to 18 fathoms ($29^{m}3$ to $32^{m}9$).

Ayninan islet (*Lat. 8° 47′ N., Long. 126° 18′ E.*), lying 1½ miles southward of Marihatag and a quarter of a mile offshore, is about 90 feet ($27^{m}4$) high to the tops of the trees. It is fringed by a reef, which partly dries, extending a quarter of a mile east-north-eastward and southward. On the western side of the islet there is a white

Charts 943, 1263.

sandy, steep-to beach. A deep passage, one cable wide, separates it from the coast.

About three-quarters of a mile and 1¼ miles eastward of Ayninan islet are two reefs, with depths of 4 and 3½ fathoms ($7^{m}3$ and $6^{m}4$) over them, respectively. A 4½-fathom ($8^{m}2$) patch lies about three-quarters of a mile south-south-eastward of the same islet. These dangers are all steep-to, and are easily distinguished by discoloration.

Antipolo village is situated on the coast of Mindanao, about 1½ miles westward of Ayninan islet, and Santo Niño village stands on the southern side of the entrance to the river of the same name, 2½ miles west-south-westward of Antipolo. Santo Niño river has a very shallow bar. A detached reef lies about three-quarters of a mile south-eastward of Santo Niño ; a 2½-fathom ($4^{m}6$) patch lies close south-eastward of this reef, and another 2½-fathom ($4^{m}6$) patch lies about 3 cables north-eastward of the reef. From a point about one mile southward of Santo Niño, a reef, which dries, extends 9 cables offshore, and a 5½-fathom ($10^{m}1$) patch lies half a mile outside the edge of this reef.

Oteiza bay lies with its entrance between the point one mile southward of Santo Niño and Jobo point, about 2¾ miles southward. In the north-western corner of the bay is Oteiza village and the river of the same name, which can be entered by boats at high water. From its mouth a sand beach extends southward for 1½ miles, thence eastward to Jobo point the shore is fringed with mangroves, which continue round the southern side of the point. Coasting steamers call at Oteiza occasionally. Salvacion village stands at the south-western corner of the bay. Jobo point is low at its end, but close within it the land rises to two hills, each about 110 feet ($33^{m}5$) high ; it is fringed by a reef which extends about 1½ cables offshore.

There are two dangerous reefs in Oteiza bay. One, which dries, lies 1¼ miles north-eastward of the church at Salvacion, and the other, which breaks in a moderate sea, lies one mile east-north-eastward of the church. Both are steep-to, and at high water with a smooth sea cannot be distinguished until directly over them. These and a small detached reef lying close offshore three-quarters of a mile eastward of the mouth of the Oteiza river, are the only dangers in Oteiza bay.

Anchorage may be obtained by vessels with local knowledge with Oteiza church bearing 324°, on which bearing a vessel should approach.

Lianga bay.—Dangers.—Lianga bay is entered between Jobo point and Banculin (Bankulin) point, 11½ miles south-eastward. The northern shore is bordered by mangroves with rounded hills rising from them, and is fringed by a reef which extends as much as one mile offshore, with numerous detached dangers. The southern shore is higher and is fringed by a wide reef as far eastward as Conceson point, about 10 miles westward of Banculin point ; thence to Banculin point the shore is rocky, with a narrow steep-to coral reef ; the cliffs here are steep, and parallel ridges rise in successive steps to the mountains in the interior.

Jobo islet (*Lat. 8° 40′ N., Long. 126° 14′ E.*), about 1¾ miles south-south-westward of Jobo point, is about 75 feet ($22^{m}9$) high to the tops of the trees. It is composed of sand and lies on a coral reef, which partly dries, extending about a quarter of a mile north-eastward and south-westward from it. Between this reef and the reef fringing the northern shore of the bay there is a channel nearly half a mile wide, but

Chart 3810.

it is not recommended as there are several shoal patches in it. A 6-fathom ($11^{m}0$) patch lies three-quarters of a mile south-eastward of Jobo islet.

A shoal, with a depth of 4 fathoms ($7^{m}3$) over it, was reported, in 1945, to lie about 1¼ miles south-eastward of Jobo point.

Haycock islands are a group of small islets and rocks lying on the shore reef from 2¾ to 3½ miles westward of Jobo point, and from about a quarter of a mile to one mile offshore. The highest islet has an elevation of 205 feet ($62^{m}5$), and they are all covered with brushwood. About 2 miles westward of Jobo islet there is a flat sand cay lying in the centre of a reef which extends about 1¼ miles south-eastward from the edge of the shore reef. Malinonok islets, three in number, lie on the shore reef, about 6 miles westward of Jobo islet. The westernmost islet is 110 feet ($33^{m}5$) high.

Lianga, a port of call for coasting steamers, is situated at the head of Lianga bay, about three-quarters of a mile southward of the mouth of Lianga river ; it contains a church which is visible from a considerable distance. The shore in front of the town is fringed with a coral reef, on which there is a rock, 35 feet ($10^{m}7$) high, lying about a quarter of a mile offshore. Landing at low water is difficult.

Anchorage, sheltered only during the South-west monsoon, may be obtained by vessels with local knowledge, in a depth of about 20 fathoms ($36^{m}6$), mud, with the church at Lianga bearing 289°, and about 4 cables south-eastward of the 35-foot ($10^{m}7$) rock.

Panirongan island, about 3 miles south-eastward of the town of Lianga, appears part of Mindanao, being separated from it by a narrow boat channel. It is wooded and about 130 feet ($39^{m}6$) high, bordered by mangroves, except on the south-eastern side, where there is a sandy beach with coconut trees behind it, on which landing for Panirongan village can be made. Tomajo rock, 25 feet ($7^{m}6$) high, lies on the shore reef close eastward of the island. Between Panirongan and Conceson point, there is a large bay encumbered by reefs and of no value to shipping ; the northern limit of the reefs is clearly defined by an almost unbroken line of breakers.

Cabgan (Kabgan) and Gabao are rocky islets lying on the northern edge of the reefs which encumber the bay just mentioned. Cabgan islet (*Lat. 8° 34′ N.. Long. 126° 10′ E.*), the western and larger, is about 100 feet ($30^{m}5$) high to the tops of the trees, and lies 1½ miles north-westward of Conceson point. Its northern side is formed by vertical cliffs, undermined by the sea, and is steep-to. Gabao islet, about 4½ cables east-south-eastward of Cabgan islet, is about 170 feet ($51^{m}8$) high to the tops of the trees. Several prominent rocks lie close off its eastern side. A channel, about a quarter of a mile wide, and with a depth of about 12 fathoms ($21^{m}9$), leads between Cabgan and Gabao islets to a deep lagoon about 2 miles in length and from 1¼ to 5 cables in width, which, although navigable by boats, is of little value to shipping.

Gamot bay, southward of Conceson point, is about one mile wide at the entrance and extends about 3 miles eastward to the mouth of Gamot river. Both sides of the bay are fringed with reefs, leaving a deep channel between them, accessible only to native canoes.

Conceson point is the western termination of a peninsula which forms the northern side of Gamot bay. On it are a number of hills

Charts 943, 1263.

Chart 3810.

the highest of which has an elevation of about 850 feet ($259^{m}1$), and slopes gradually to the shore of Lianga bay. Sua islets, 65 and 100 feet ($19^{m}8$ and $30^{m}5$) high, lie close off the south-western side of Conceson point. A prong of the shore reef extends about one mile northward from the western end of Conceson point.

Banculin point is a prominent headland, 590 feet ($179^{m}8$) high. A reef, on which there are numerous rocks, the largest of which is 70 feet ($21^{m}3$) high, and covered with vegetation, extends about one mile eastward from the point. In the bay southward of this reef there is an extensive area clear of dangers, but its entrance is blocked by a reef which dries.

Singag island, 185 feet ($56^{m}4$) high, lies about 1¼ miles eastward of Banculin point, being separated from the coastal reef by a narrow channel which is foul, with a depth of 2¾ fathoms ($5^{m}0$) near the middle. The island has steep rocky cliffs on all sides, and is steep-to on the north and south, with depths of from 6 to 7 fathoms ($11^{m}0$ to $12^{m}8$) extending half a mile eastward from it.

Current.—Off the coast between Banculin point and the northern entrance point of Bislig bay, about 15 miles southward, there is a constant south-going current of moderate strength, but in the narrow channels among the numerous coral reefs lying in the bays on this coast, the current is influenced by the north-going tidal stream, causing frequent swirls and eddies.

Coast.—Lamon point, about 5 miles south-south-eastward of Banculin point, consists of vertical cliffs, about 50 feet ($15^{m}2$) high, with a narrow, rocky beach at low water. Northward of the point the narrow valleys are separated by points formed of vertical cliffs, and the coastal reefs entirely fill the indentations in the coast. Southward of Lamon point there is a bay about 2¾ miles wide at its entrance, almost filled by an extensive reef, on which Bagasinan island lies.

Bagasinan island, 150 feet ($45^{m}7$) high, has steep, rocky sides. The eastern end, which is 100 feet ($30^{m}5$) high, appears to be cut off from the main part of the island, being separated from it by a narrow boat passage at high water. Foul ground extends about half a mile eastward, and a reef, separated by a shallow narrow channel, lies within half a mile of the northern side of the island.

A bank lies south-eastward of the eastern end of Bagasinan island; the least depth of 2¾ fathoms ($5^{m}0$) lies 1½ miles from that point, with a 3-fathom ($5^{m}5$) patch about 6 cables westward of it. Between the latter shoal and the reefs and shoals extending from the coast of Mindanao westward of it there is a clear channel a quarter of a mile wide. The sea breaks on the shoals in heavy weather, but with smooth water they are difficult to distinguish.

Lamon anchorage. — Dangers. — Buoys. — Beacons. — Lamon anchorage, situated between the reef northward of Bagasinan island and the reef fringing the northern shore of the bay in which that island lies, affords fairly protected anchorage for moderate-sized vessels with local knowledge, in depths of from 6 to 7 fathoms ($11^{m}0$ to $12^{m}8$), mud. This anchorage is open eastward, but is reported to afford protection from north-easterly winds and seas.

A shoal, with a depth of 3 fathoms ($5^{m}5$) over it, lies about 4 cables southward of Lamon point (*Lat. 8° 28′ N., Long. 126° 24′ E.*), and is marked on its northern side by a black can buoy. A shoal, with a

Charts 943, 1263.

Chart 3810.

depth of 2¼ fathoms (4^{m}1) over it, lies 4 cables south-westward of Lamon point.

Two triangular beacons, 20 feet (6^{m}1) in height, are situated at the head of the bay and when in line, bearing 260°, lead close northward of the 3-fathom (5^{m}5) shoal. Vessels proceeding to Lamon anchorage should not get southward of the leading line.

A rock, 20 feet (6^{m}1) high, lies on the fringing reef, 4½ cables westward of Lamon point, about three-quarters of a cable offshore.

A red conical buoy marks the southern edge of the shore reef, about 3¾ cables south-westward of the 20-foot (6^{m}1) rock mentioned above.

On the northern side of the anchorage there is a wharf, which, in 1937, had depths of from 24 to 28 feet (7^{m}3 to 8^{m}5) alongside, the greater depth being at the western end. Water is laid on to the wharf.

Coast.—The village of San Juan is situated about three-quarters of a mile southward of the southern entrance point of the bay in which Bagasinan island lies.

Mahaba island, about 6 feet (1^{m}8) high, lies about 1¼ miles south-eastward of San Juan village and about half a mile offshore. It is fringed with reefs which extend about half a mile from its northern side and about 3½ cables from the eastern side. The greater part of the island is covered with trees and bushes, and there are a few houses on the western side. A snug anchorage may be obtained by small vessels with local knowledge, with a draught not exceeding 8 feet (2^{m}4), about half a mile southward of the mangrove islet in the channel westward of Mahaba island. The channels among the reefs southward and eastward of this anchorage are narrow and tortuous, with strong tidal streams.

Tigdos island, about three-quarters of a mile south-eastward of Mahaba island, is 110 feet (33^{m}5) high to the tops of the trees. It is a good landmark when approaching Hinatuan from northward. It is fringed by a reef which extends 6½ cables south-eastward and about 4 cables north-eastward.

The town of Hinatuan (*Lat. 8° 22′ N., Long. 126° 20′ E.*), an important shipping centre for this part of Mindanao, stands on the western side of the river of the same name, 3¼ miles south-westward of Mahaba island. Boats with a draught of 7 feet (2^{m}1) can cross the bar at high water and secure to the wharf in front of the town. About one mile above its entrance the river is encumbered with rocks, but native boats can ascend for more than 20 miles. Strong tidal streams set fair with the channel, which is usually marked by stakes or beacons.

The usual anchorage for Hinatuan is about 1½ miles south-eastward of the river mouth, in a depth of 4 fathoms (7^{m}3), mud. Better protected anchorage may be obtained by vessels with local knowledge behind the reefs farther northward, in a depth of 7 fathoms (12^{m}8), mud, with Manomawan islet, situated about 2¼ miles south-westward of Tigdos island, bearing 120°, distant half a mile. The approach to Hinatuan anchorage is deep, clear and nearly one mile wide. It is bordered on both northern and southern sides by numerous reefs and shoals, the most dangerous one being a shoal, with a depth of 2¼ fathoms (4^{m}1) over it, lying 1¼ miles south-south-eastward of the eastern end of Tigdos island ; the sea has been observed to break on it, but in smooth water has the same appearance as the deep water round it.

Mancahorom (Mankahorom) island marks the eastern end and

Charts 943, 1263.

Chart 3810.

Maowa island the western end of the chain of shoals lying on the southern side of the approach to Hinatuan. The former is fringed by a reef which extends about 2½ cables from its northern and eastern sides, and vessels should pass eastward and northward of it at a distance of not less than half a mile. Both islands are low, but trees and palms make them excellent marks.

Loyola is a small settlement near the mouth of the Bigaan river, 2 miles southward of Hinatuan; the latter is navigable for a small boat for about 5 miles from its mouth, but sand bars encumber the entrance. Extensive coral reefs, with small mangrove islets and mud flats, fill the head of the bay south-eastward of Loyola.

Mawes island lies on an extensive coral reef close off the northern entrance point of Bislig bay, about 5 miles south-eastward of Hinatuan, and is separated from the coastal reef by a narrow channel, with a depth of 3½ fathoms (6^{m}4). There are some coconut trees on the south-western end of the island. The remainder of the island is covered with trees and bushes and its entire coast is fringed with mangroves.

Bislig bay.—Dangers.—Bislig bay, entered between Mawes island and Sanco (Sanko) point, 4¾ miles south-eastward, is encumbered with numerous shoals and reefs. A heavily wooded ridge, about 600 feet (182^{m}9) high, lies along the south-eastern side of the bay. On the north-western side the land rises gradually to an elevation of about 420 feet (128^{m}0), the shore being fringed with mangroves and bordered by a coral reef extending as much as one mile off, on which lie Tumano, about 4 miles south-westward of Mawes island, and several other mangrove islets. Agonoy islet lies on a detached coral reef, about 6 feet (1^{m}8) high, 1¼ miles eastward of Tumano islet, and is bordered by a sandy beach; a coconut grove on it makes it prominent.

The valley of Bislig river, which discharges into the north-western corner of the bay, about 2½ miles south-westward of Tumano islet, is low, flat, and heavily wooded. The river is navigable for small boats beyond San Jose, a small settlement about 5 miles above its mouth. Launches drawing from 6 to 8 feet (1^{m}8 to 2^{m}4) can enter the river at half tide, the channel across the bar being usually marked by stakes, but care is necessary as the tidal streams are strong.

Bislig, at the mouth of Bislig river, and Haramelio, in the southern angle of the bay, are the only settlements on the shore of the bay and are of little commercial importance.

Sanco point (*Lat. 8° 15′ N., Long. 126° 27′ E.*) is low, thickly covered with bushes, and has a white sandy beach. A coral reef, which dries, extends about 1½ miles eastward and 2½ miles south-eastward from the point.

Anchorages.—Directions.—A vessel entering Bislig bay should keep from half to three-quarters of a mile off the south-eastern shore, where the channel is about 6 cables wide in its narrowest part, until Agonoy islet bears 320°, when she should alter course to 272°, which leads to an anchorage, in depths of from 4 to 5 fathoms (7^{m}3 to 9^{m}1), off the mouth of Bislig river. If bound to Haramelio or the head of the bay, she should keep three-quarters of a mile offshore to avoid two shoals, with depths of 2 fathoms (3^{m}7) over them, lying about 5 miles within Sanco point and 4 cables from the south-eastern shore, and anchor according to draught. The head of the bay is shoal and affords no protection from north-easterly winds. Some protection from the seas may be obtained by vessels with local knowledge in the north-western corner of the bay, behind the reefs, but the anchorage space is very limited.

Coast.—Dangers.—Between Sanco point and Catarman (Katarman) point, about 15 miles southward, the coast is bordered by a reef, which extends about 2 miles offshore near the northern and southern ends. The land rises to a densely wooded ridge. Valencia village, which is not visible from seaward, stands about three-quarters of a mile southward of Sanco point. About 5 miles southward of Sanco point is the town of Barcelona, off which there is a break in the coastal reef, but in the entrance, about three-quarters of a mile offshore, there is a shoal, with a depth of 2¼ fathoms (4^{m}1) over it, which narrows the channel of approach to a width of about 2 cables.

Anchorage may be obtained by vessels with local knowledge, in the break of the reef mentioned above, in a depth of 7 fathoms (12^{m}8), sand, about half a mile south-westward of Maopia islet, which is 20 feet (6^{m}1) high, and lies on the coastal reef 8½ cables eastward of Barcelona. This anchorage is well protected by the reef in all directions, except from south-eastward. The best landing for Barcelona is at the mouth of Taon river, which discharges on the southern side of the town.

A shoal, with a least depth of 3 fathoms (5^{m}5) over it, lies 2¼ miles north-eastward of Maopia islet, and 1¾ miles offshore, and a shoal, with a depth of 4 fathoms (7^{m}3) over it, lies about 1½ miles southward of the same islet and one mile offshore. Both of these shoals break in a moderate sea. A 7-fathom (12^{m}8) patch lies about 2 miles eastward of Maopia islet.

Tambog point (*Lat. 8° 06′ N., Long. 126° 27′ E.*), about 9 miles southward of Sanco point, is covered with scattered trees and bushes, and is prominent. It has two prongs, the southern and higher of which has an elevation of about 50 feet (15^{m}2). About half a mile within the extremity of the point the land rises to an elevation of 260 feet (79^{m}2). The bight northward of Tambog point is partially protected from the swirls and southerly current which prevail off the point.

Lingig (Lingit), near the mouth of Lingig river, 4½ miles south-south-westward of Tambog point, is a town of little importance. The best boat landing is found by following the break in the reef northward of the town at half tide, thus gaining the protection of the reef.

Catarman anchorage.—Catarman (Katarman) anchorage is formed between Catarman (Katarman) point and a break in the coastal reef northward of it. The entrance between the reef extending from the northern side of Catarman point and a detached reef on the northern side of the channel is about 2 cables wide, increasing to half a mile inside. The depths decrease from 18 fathoms (32^{m}9) at the entrance to 7 fathoms (12^{m}8), mud, one mile farther in, where safe anchorage may be obtained by vessels with local knowledge, a quarter of a mile from the southern shore.

Catarman point is steep, with rocky cliffs, about 40 feet (12^{m}2) high. It is covered with bushes and some trees. Majangit (Mahangit) islets, two in number, 90 and 100 feet (27^{m}4 and 30^{m}5) high, lie on the coastal reef about 1½ miles northward of Catarman point. A 6½-fathom (11^{m}9) patch lies about one mile east-north-eastward of the northern of the Majangit islets, and a 7-fathom (12^{m}8) rocky patch lies close

Chart 3810.

outside the edge of the coastal reef, about three-quarters of a mile east-south-eastward of the same islet.

Cateel bay.—Dangers.—Cateel (Kateel) bay, entered between Catarman point and Bangai point, about 17 miles south-eastward, is free from dangers outside a distance of 1½ miles of the shore ; it is almost free from currents. The shore is fringed by a reef, which extends nearly one mile off in places and shows a white sandy beach. The land rises to a high, flat-topped, densely wooded ridge ; farther inland there are several peaks among the higher mountains.

Hamuan island, on the shore reef, 2½ miles south-westward of Catarman point, is 275 feet ($83^{m}8$) high, and wooded ; the southern and eastern sides are rocky, the western side is cleared. Several rocky islets, from 90 to 180 feet ($27^{m}4$ to $54^{m}9$) high and covered with bushes, lie on the reef between Hamuan island and Catarman point. An extensive detached reef, the coral heads on which the sea always breaks, lies half a mile south-eastward of Hamuan island with a deep channel between it and the shore reef.

Cabugao (Kabugao) island, 220 feet ($67^{m}1$) high and wooded, lies on the edge of the shore reef north-eastward of the village of Boston, 8½ miles south-westward of Catarman point. A rock, which dries, lies about half a mile northward of the eastern extremity of Cabugao island. It lies in the fairway of the northern approach to the anchorage off Boston, and is difficult to distinguish with a smooth sea. Boston is an important shipping centre for this part of Mindanao. The village of San Roque is situated 2¾ miles northward of Boston.

Anchorage may be obtained by vessels with local knowledge, in depths of from 5 to 7 fathoms ($9^{m}1$ to $12^{m}8$), mud, about half a mile north-westward of Cabugao island (*Lat. 7° 53′ N., Long. 126° 23′ E.*). It is open from north to east and may become untenable during heavy easterly weather.

A shoal, with a least depth of 4½ fathoms ($8^{m}2$) over it, lies 1¼ miles south-south-eastward of Cabugao island, and about three-quarters of a mile offshore.

Between Tonquil (Tonkil) point, situated about 6 miles south-eastward of Boston, and Tanguip point, 6½ miles farther in the same direction, there is a break in the high ridge near the shore, forming a wide fertile valley drained by Cateel (Kateel) river, which discharges about one mile south-south-eastward of Tonquil point. The channel across the bar of the river is about half a cable wide and carries a depth of about 5 feet ($1^{m}5$), with greater depths inside, but the river can only be entered in the smoothest sea. The strong tidal streams cause confused seas near the entrance. The town of Cateel (Kateel) stands on the northern side of the entrance.

Anchorage may be obtained by vessels with local knowledge from a quarter to three-quarters of a mile offshore anywhere between Tonquil and Tanguip points, in depths of from 12 to 14 fathoms ($21^{m}9$ to $25^{m}6$), mud and sand, but preferably off the mouth of Cateel river.

Coast.—Dangers.—Bagoso island, lying on the coastal reef which dries about 3 feet ($0^{m}9$) in places, half a mile south-eastward of Bangai point, is a good landmark when seen from northward or southward ; a large tree on Quinablangan (Kwinablangan) island, 6 cables southward of Bagoso island, is especially prominent, being visible for 20 miles up and down the coast. Both islands are only about 7 feet ($2^{m}1$) high,

Charts 943, 1263.

Chart 3810.

with their seaward faces of coral rock formation. A break in the reef leads between Quinablangan island and the coast of Mindanao.

San Victor island, about 2 miles southward of Quinablangan island, with a narrow channel separating it from the Mindanao coast, is the largest of a number of islands, covered with bushes, lying on the reefs between Quinablangan island and Paypay point, 6¾ miles southward of Bangai point. A 1½-fathom (2^m7) patch lies 6 cables north-north-eastward of San Victor island and 6 cables offshore. An extensive area encumbered with shoals lies within 1¼ miles north-eastward, eastward and southward of San Victor island; there are three patches in this area which dry, and on which the sea breaks heavily at all times. Another detached reef lies about midway between Paypay point and the mouth of the Dapnan river, 1½ miles north-westward. Anchorage may be obtained by vessels with local knowledge during fine weather off the mouth of the Dapnan river.

Baganga bay.—Danger.—Baganga bay is entered between Lambajon (Lambahon) point, one mile southward of Paypay point, and a point about 2 miles farther southward. A reef extends about 3½ cables southward from Lambajon point, and a detached reef, which breaks, lies about half a mile south-westward of the same point. Good anchorage, protected from northerly and easterly winds, may be obtained by vessels with local knowledge, in a depth of 7 fathoms (12^m8), mud, about half a mile westward of Lambajon point, and a quarter of a mile offshore. The detached reef, which breaks, divides the approach to this anchorage into two channels, of which the western is the better, being the wider and having regular depths. Anchorage, protected from south-easterly and southerly winds, may be obtained in the southern part of Baganga bay, in a depth of 5 fathoms (9^m1), sand, a quarter of a mile offshore. Baganga (*Lat. 7° 34′ N., Long. 126° 34′ E.*), the only town of importance, stands on the southern side of the entrance to Baganga river, on the south-western shore of the bay, about three-quarters of a mile westward of the southern entrance point. Some of the houses are visible from the bay but the church is partially obscured by trees. Neither Baganga river nor Panglimasan river, about 1¾ miles northward, can be entered by boats at low water.

Radio station.—There is a radio station at Baganga. *See* page 14.

Coast.—Dangers.—Daquit islet lying on the coastal reef which fringes the southern entrance point of Baganga bay, is low, covered with trees and bushes, and from a distance appears to be part of the coast of Mindanao. The coast thence to Baculin (Bakulin) point, 7 miles southward, is fringed by a steep-to coral reef, clear of dangers. Languyon river, which discharges 1¾ miles northward of Baculin point, has a wide mouth, but can only be entered at half tide through a narrow channel near the southern bank.

Between Baculin point and Pusan point, 9½ miles southward, there are three indentations in the coast. The northern, named Baculin (Bakulin) bay, entered between Baculin point and Bacul (Bakul) point, about 3½ miles south-south-westward, has considerable depths and is clear of danger. Both points are low and fringed by reefs which extend about 2 cables offshore. There is a sandy beach at the head of the bay. The villages of Baculin (Bakulin) and San Luis stand on the northern shore of the bay about three-quarters of a mile and 2½ miles, respec-

Charts 943, 1263.

Chart 3810.

tively, westward of Baculin point, and Manorigao, on the southern shore, about one mile westward of Bacul point.

Anchorage, protected from northerly and north-easterly winds, may be obtained by vessels with local knowledge, in depths of from 7 to 10 fathoms ($12^{m}8$ to $18^{m}3$), sand, about 2 miles westward of Baculin point, and half a mile offshore.

The bay which is entered between Bacul point and Alisud point, about 4 miles southward, does not afford any safe anchorage. The village of Santa Fe stands on the northern side of the entrance to Hipayaan river, about 1¾ miles south-westward of Bacul point. A rock, which dries and is always marked by breakers, lies one mile southward of Bacul point.

Caraga (Karaga) bay, entered between Alisud point and Pusan point, affords anchorage for vessels with local knowledge, protected in easterly and south-easterly winds, in the south-western corner off Santiago village. The anchorage off Caraga (Karaga), situated on Alisud point, is available in fair weather only; the depth and the nature of the bottom render it unwise for any vessel to remain in this vicinity during heavy weather.

Caraga is an important shipping point for the products of this part, and is a port of call for coasting steamers. Caraga river can be entered by small boats at half tide; heavy breakers extend across the entrance even during moderate weather.

Charts 3810, 2575.

Pusan point is steep-to. Heavy tide-rips and swirls occur off this point even in moderate weather, and are apparently caused by the constant south-going current.

Between Pusan point and Tugubun point, 20 miles south-south-westward, the points between consist of coral cliffs, from 15 to 30 feet ($4^{m}6$ to $9^{m}1$) high, with sand and shingle beaches at the heads of the several bays. The coastal ridge does not show any prominent landmarks; it is separated from the higher mountains inland by a depression of 400 or 500 feet ($121^{m}9$ or $152^{m}4$) and the entire coast is heavily wooded. The only danger to navigation along this coast is a coral shoal lying 2¼ miles northward of Tugubun point; it is connected with the coastal reef and has a depth of 1½ fathoms ($2^{m}7$) at its outer end, 6½ cables offshore, with a detached shoal with a depth of 4¾ fathoms ($8^{m}7$) a quarter of a mile eastward of it.

No anchorage, protected from easterly or southerly winds is available along this stretch of coast. At the head of Bunga cove, 4¼ miles south-south-westward of Pusan point (*Lat. 7° 18′ N., Long. 126° 36′ E.*), there is a small indentation, into which Bunga creek flows, and which boats can enter. Batinao point, the southern entrance point of Bunga cove, is a high, coral cliff.

About 1½ miles south-south-westward of Batinao point is Manaol point, the north-eastern entrance point of Manay bay, which affords anchorage protected from west, through north, to north-east. A rock, 36 feet ($11^{m}0$) high, lies close to the cliff of Manaol point, and is a good mark from northward or southward. Manay village, standing on the eastern side of the entrance of Manay river about 1¾ miles west-north-westward of Manaol point, is an occasional port of call for coasting steamers. The river can be ascended a short distance by boats. Casauman river, about 2¼ miles south-south-westward of the mouth of

Charts 943, 1263.

Charts 3810, 2575.

Manay river, can be entered by small boats at low water. In front of the river mouth is a high shingle ridge thrown up by the heavy seas that frequently prevail along this coast. There are frequently heavy tide-rips off Casauman (Kasauman) point, 3¾ miles south-south-westward of Manaol point.

The coast between Casauman point and Yako point, 6 miles south-westward, is indented by four bays, all open eastward and southward-in which there are several villages. The villages of Santa Cruz, about one mile westward of Casauman point, San Ignacio, about 2 miles south-westward of Santa Cruz, and Quinonoan (Kwinonoan), about 2½ miles south-westward of San Ignacio, are all ports of call for the coasting steamers. The four bays mentioned above are separated by Buan, Manduao and Tambuc (Tambuk) points, situated about 1¾, 2¾ and 4½ miles, respectively, south-westward of Casauman point. Tarragona village, about 2 miles south-westward of Yako point, is an occasional port of call for coasting steamers. Hemp and copra are the principal products of the country.

Mayo bay.—Mayo bay, entered between Tugubun point and Lamigan point, about 13 miles south-westward, is an open bay with considerable depths that affords only a very precarious anchorage, even in fair weather. The tidal streams are weak within the bay, but at the entrance points they come in conflict with a strong south-going current of about 2¼ knots and frequently cause heavy tide-rips. The only known danger is a small reef, which dries, lying 2½ cables south-eastward of Flaca (Flaka) point on the north shore of the bay, 3¼ miles westward of Tugubun point, with a channel with a depth of 3½ fathoms ($6^{m}4$) between it and the shore. The northern shore of the bay is similar to the coast northward of Tugubun point. At Tacaquinay point, 2¼ miles westward of Flaca point, the cliffs are of hard conglomerate, rising 200 feet ($61^{m}0$) vertically in four separate headlands separated by deep gorges. Mount Ambutig, 1,940 feet ($591^{m}3$) high, with a sharp grassy top, lies about 1½ miles north-north-eastward of Tacaquinay point, and is prominent. The remainder of the shore of Mayo bay is a prominent shingle beach overlying a coral reef, with the exception of Gorda point, 4¾ miles south-westward of Tacaquinay point, which is a rocky ledge, with a broad sand beach in the bay westward. Bobon point, about 3 miles northward of Lamigan point, is low.

The s.s. *El Oso* reported, in 1930, having passed over a disturbance of considerable vibration lasting for about four seconds, in a position about 14 miles east-south-eastward of Tugubun point.

Lucatan and Mayo, situated on the northern shore of Mayo bay, about 2 and 7½ miles, respectively, westward of Tugubun point, are the principal settlements.

Chart 2575.

Lamigan point (*Lat. 6° 49′ N., Long. 126° 21′ E.*) is the south-eastern extremity of the Guanguan peninsula, separating Mayo and Pujada bays; it terminates in a vertical cliff, 108 feet ($32^{m}9$) high. The 1,825-foot ($556^{m}2$) summit, about 2 miles north-westward of the point, is a very prominent mark for vessels approaching Pujada bay.

Chart 415.

Pujada bay.—As the chart of Pujada bay differs very considerably from the latest United States Government chart, it must be used with caution.

Charts 943, 1263.

Chart 415.

Pujada bay, entered between Lamigan point and Tumadgo point, about 6½ miles south-westward, is too deep to afford good anchorage, though well sheltered. The land in the vicinity of the entrance rises steeply from the water's edge, the shores being fringed by a narrow coral reef, except at Taganilao village, about 1½ miles westward of Lamigan point, where the reef extends 4 cables offshore. The land on the eastern side of the bay northward of Batiano point, situated about 3½ miles north-westward of Taganilao village, is low, and a coral reef extends as much as three-quarters of a mile offshore. The western shore is steep-to, and the land is high, and densely wooded.

Pujada island, 485 feet (147^{m}8) high, and partially wooded, lies in the entrance of the bay and divides it into two deep channels. It is fringed by a reef, which extends about half a cable from the south-western side, about one cable from its north-western end, and gradually widens on the north-eastern side, attaining its greatest width of 2 cables at the south-eastern end. Two prominent sand islets on drying reefs lie about 6½ cables and one mile south-eastward of the island. They are separated from each other by a narrow channel, with a depth of 3½ fathoms (6^{m}4), and from Pujada island by a channel a quarter of a mile wide, with a depth of 3¼ fathoms (5^{m}9) in it.

A shoal, with a depth of 3½ fathoms (6^{m}4) over it, lies outside the fringing reef, about 3 cables from the middle of the north-eastern side of Pujada island.

Tumadgo point is a crumbling cliff, about 800 feet (243^{m}8) high; the land within it rises in irregular ridges to Mount Hamiguitan, 5,343 feet (1,628^{m}6) high, about 5 miles westward. Magum (Magun) and Makumbol (Makambol) are small settlements on the south-western shore of Pujada bay, about 1½ and 6½ miles, respectively, north-westward of Tumadgo point.

Unanivan island, 105 feet (32^{m}0) high and covered with trees, lies on the eastern side of the bay about three-quarters of a mile north-westward of Taganilao point (*Lat. 6° 50′ N., Long. 126° 17′ E.*), about one mile southward of Batiano point; it is connected to Taganilao point by a reef, with a depth of 5½ fathoms (10^{m}1) over it, in the middle. The island has a sand beach on its eastern side, but is rocky on the west, and a wide coral reef, which dries, extends about a quarter of a mile south-eastward.

Guanguan estero, entered about 4½ miles north-north-westward of Batiano point, is entirely filled by reefs, which extend nearly one mile off the coast between points, 2 and 4½ miles northward of Batiano point.

Balete bay, entered westward of Daca point, on the western side of Pujada bay, about 9 miles north-north-westward of Tumadgo point, affords perfectly protected anchorage for small vessels. About three-quarters of a mile north-westward of Daca point, the entrance channel is narrowed to a width of one cable by a shoal with a least depth of one foot (0^{m}3) on the western side of the fairway. The shores of Balete bay are fringed by reefs, which extend as much as 3 cables off, and the head of the bay is bordered by mangroves.

Anchorage may be obtained in Balete bay, in depths of from 16 to 20 fathoms (29^{m}3 to 36^{m}6), north-westward of the one-foot (0^{m}3) shoal, or near the head of the bay, in a depth of 8 fathoms (14^{m}6), mud.

Daca point and Tataidaga point, about 8½ cables north-eastward,

Charts 2575, 943, 1263.

Chart 415.

are the south-western and south-eastern extremities of the peninsula separating Balete bay from the main part of Pujada bay. The coast between Daca point and Tataidaga point is fringed by a reef; a spit, with a depth of 4 fathoms (7^{m}3) at its outer end, extends about half a mile south-eastward, and a 5-fathom (9^{m}1) patch lies about half a mile eastward of the same point and about 2¾ cables offshore.

Lacutan cove, on the eastern side of the peninsula mentioned above, is fringed by a reef, which extends as much as a quarter of a mile offshore, and there is a detached shoal, with a depth of 3½ fathoms (6^{m}4) over it, about 3 cables northward of the south-eastern entrance point.

Cabayan point, 2½ miles northward of Tataidaga point, is high and rocky. Camansi point, about 8 cables northward of Cabayan point, is fringed by a reef; a detached rock lies half a mile eastward of Camansi point.

Mati.—Light.—Mati, the seat of government and the most important town of this vicinity, stands at the head of Pujada bay. There is regular steamer communication with other ports in the Philippines and it is an important shipping place for hemp and copra. The inhabitants are mostly Visayans; there is a Moro settlement, named Babiasan, at the mouth of Guanguan estero, and another one, named Bajukan, in Balete bay.

A light is exhibited, at an elevation of 36 feet (11^{m}0), from a white framework structure, on the beach at Mati (*Lat. 6° 57′ N., Long. 126° 13′ E.*).

There is a pier which, in 1938, had a depth of 20 feet (6^{m}1) at its head, where there was a berth for one vessel.

Anchorages.—Anchorage may be obtained off the town of Mati, in depths of from 15 to 18 fathoms (27^{m}4 to 32^{m}9), sand, about 2 cables offshore.

Good anchorage may also be obtained one mile northward of Batiano point, in depths of from 15 to 20 fathoms (27^{m}4 to 36^{m}6), about half a mile offshore.

Radio station.—There is a radio station at Mati. *See* page 14.

Chart 2575.

Coast.—The northern half of the stretch of coast between Tumadgo point and Cape San Agustin, 29 miles southward, is characterised by steep, cliffy points, from the top of which the land rises steeply to the higher mountains inland. The cliffs are of soft rock, which are undermined by the heavy seas, and the fallen rock forms large boulders on the narrow ledge at the foot of the cliffs. Between the several points, of which Macaonan, Nagas, and Salasala, situated about 3, 8½ and 12 miles, respectively, southward of Tumadgo point, are the most prominent, are narrow valleys that rise steeply from the coast. A rock, 10 feet (3^{m}0) high, lies on the edge of the coastal reef, about 6½ cables eastward of Kabuaya village, situated about 2 miles southward of Salasala point.

Luban island, 7 miles southward of Salasala point, is 219 feet (66^{m}7) high, and has an almost vertical cliff face on its eastern side, gradually sloping to the mangroves on its western side. A large rock, 25 feet (7^{m}6) high, lies close to the cliff. At high water launches drawing not more than 4 feet (1^{m}2) can pass westward of the island into a small lagoon in front of Luban town; entrance to this lagoon from the

Charts 943, 1263.

Chart 2575.

southern side is difficult owing to boulders on the drying reef which connects the island with the Mindanao coast.

About 3 miles northward of Lagum point (*Lat. 6° 19′ N., Long. 126° 12′ E.*), situated 6¼ miles southward of Luban island, there is a decided change in the character of the vegetation. The country northward is heavily wooded with large trees, and has the appearance of jungle; southward the trees are stunted and from a distance offshore the large-leaved palms have the appearance of nipa houses.

For about 2 miles northward of Cape San Agustin there is a succession of sandy beaches, separated by rocky bluffs.

There are no good anchorages along this coast, but in case of necessity anchorage may be obtained by vessels with local knowledge at several places. About one mile offshore, there is a constant south-going current. Close offshore there is an eddy and the direction of the current seems to be influenced by the tides. Heavy tide-rips and swirls are encountered around Luban island and southward.

Cape San Agustin light and reef have been described on page 296.

Charts 3810, 2575.

Current off the east coast of Mindanao.—A constant south-going current sets off this coast, especially outside a distance of 4 miles. Within this distance the tidal streams preserve their influence in some places, but near the projecting points the current remains constant. Northward of Mayo bay (page 629) the current shows itself in strong races, which increase in force on approaching Pusan point, where they attain their greatest strength. They are very violent off Bagoso island, and the entrance points of Baganga bay. Near the coast the sea is always rough.

Charts 943, 1263.

APPENDIX I

LIST OF PORTS AVAILABLE FOR UNDER-WATER REPAIRS, with details of Largest Patent Slip at each Port.

NAME OF PORT AND DOCK	Length from bilge of Caisson or Mitre Post of gates at		Breadth of Entrance at		‡ Distance {below (+) above (−)} Chart datum level of			Mean rise of higher high water	FLOATING DOCKS, PATENT SLIPS, &c.			REMARKS
	Coping head	Floor head	Coping	MHWS level	Sill	Blocks, at			Maximum depth over blocks		Lifting power	
						Entrance	Head		Forward	Aft		
	(1)*	(2)*	(3)†	(4)†	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Tons	
SANDAKAN : Patent slip . . .	393	150	—	—	—	—	—	3	5·5	10·5	500	
ILOILO : Patent slip . . .	—	119·5	—	—	—	—	—	5·4	6	11	300	
CEBU : Patent slip . . .	700	320	—	—	—	—	—	—	10	24	1,000	

---

* In the case of Floating Docks, Patent Slips, &c., Column (1) = Extreme Length. Column (2) = Length on Blocks or Cradle.

† In the case of Floating Docks, Column (3) = Breadth at Top. Column (4) = Breadth at bottom of Dock.

‡ In order to find the depths on Sill, &c., the quantities in columns (5), (6) and (7), should be applied according to sign to the predicted or calculated height of tide as obtained from the Admiralty Tide Tables.

APPENDIX II

LIST OF PRINCIPAL PORTS, SHOWING PARTICULARS OF DEPTHS, &c.

PORT	Depth below Chart datum level		Rise of Tide		REMARKS
	In channel of approach	In anchorage	Spgs.	Nps.	
		Fathoms	Feet	Feet	
Puerto Princesa ...	Deep	9 to 10	4¼	2¼	
Kudat	Deep	6½	7	5¼	
Sandakan	4 fms.	7	6¼*	—	
Tawau	Deep	7½ to 8½	9	6	
Jolo	Deep	10 to 12	3	1	
Davao	Deep	12	4¾	—	Anchorage off Santa Ana.
Port Galera	7 fms.	6 to 12	3¾*	—	
Iloilo	7–8 fms.	15	5¼	3¼	Approach from south-west.
	20 feet	—	—	—	Approach from north-east.
Port Romblon	Deep	14 to 16	5¼*	—	
Port Batan	4 fms.	5 to 7	5½*	—	
Port Balanacan ...	Deep	7 to 11	4½*	—	
Sorsogon bay	Deep	2½ to 7	4*	—	
Port San Jacinto .	Deep	7 to 10	4½*	—	
Port Barrera	Deep	22	5*	3¼	
Masbate harbour ..	Deep	16 to 17	5*	—	
Port Cataingan	Deep	4 to 10	4½*	—	
Catbalogan	Deep	4 to 6	5*	—	
Port Gubat	Deep	4 to 5	4½*	—	
Port Cebu	4½ fms.	6 to 10	4½	3	Approach from north.
	5¾ fms.	—	—	—	Approach from south.
Misamis	Deep	4½ to 6	4¼*	—	
Port San Vicente..	Deep	7	3½*	—	Outer harbour.
	6 fms.	4 to 4½	—	—	Inner harbour.
Casiguran bay	Deep	15	4½*	—	
Polillo harbour ...	Deep	9	4¾*	—	
Hondagua harbour	Deep	5 to 12	—	—	
Lamit bay	Deep	4 to 8	—	—	
Legaspi	Deep	17 to 22	5	3½	
Port Libas	Deep	2½ to 5	—	—	
Port Borongan ...	Deep	5 to 12	5*	—	
Tacloban	18 feet	5 to 6	2½*	—	Approach from north.
	19 feet				Approach from south.
Surigao	Deep	14 to 16	3½*	—	
Mati	Deep	15 to 18	4¾*	—	

* Mean rise of higher high water.

APPENDIX III

LIST OF SPOTS SUITABLE FOR MAGNETIC OBSERVATIONS.

Place	Lat. N	Long. E
Zamboanga	6° 55′	122° 04·1′
Iloilo	10° 42·2′	122° 34·2′

INDEX

Page
Abag bay . 297
Abanay island . 601
Abatan river . 473
Abel reef . 481
Aborlan :
  Mount . 92
  River . 93
  Town . 93
Abriop bank . 540
Abucayan inlet . 90
Abucayan point . 472
Abugoin point . 512
Abulug river . 501
Abulug village . 501
Abuyog town . 583
Acha reef . 387
Acha rock . 262
Aclan point . 349
Aclan river . 349
Ada reef . 105
Adal island . 163
Adam reef . 481
Adams reef . 166
Addison peak . 96
Addison point . 89
Adlai village . 606
Adlay village . 606
Adolphy point . 183
Afuera shoal . 307
Agas point . 183
Agauan islet . 566
Agban bay . 548
Agbatan point . 341
Agbatang bay . 327
Agdan point . 571
Agho islet . 360
Agio point . 476
Agnas point . 394
Agno river . 1
Agoho :
  Point ; Catanduanes island . 542
  Point ; Tablas island . 330
  Town . 494
Agojo point . 572
Agong Agong river . 122
Agong Agong, Tanjong . 122
Agonoy islet . 624
Agos river . 510
Agos village . 460
Agpitan islet . 376
Agria point . 510
Agta point . 512

Page
Aguada :
  Bay . 196
  Island . 422
  Mount . 67
  Point . 416
Aguasa bay . 375
Aguda rock . 532
Agudo, Mount . 353
Aguhuc point . 518
Aguinin point . 468
Aguirre :
  Bank . 218
  Port . 419
  Reef . 47
Aguja peak . 142
Aguja point . 388
Agukan point . 615
Agus river . 491
Agusan province . 498
Agusan river . 497
  Anchorages . 498
  Beacon . 497
  Buoys . 497
  Directions . 498
  Light . 497
  Pilots . 498
Agutaya island . 66
Agutayan island . 547
Agutayan islet . 438
Ahui bay . 361
Ahui village . 361
Ahus :
  Point . 373
  Pulau . 186
  Rivier . 187
  Tanjong . 187
Air lights, general remarks . 15
Airy, Mount . 89
Ajus point . 373
Ajuy :
  Bay . 361
  River . 361
  Village . 361
Aklan point . 349
Aklan river . 349
Alabat :
  Island . 516
    north-eastern side . 517
  Point . 576
  Port . 517
  Town . 517
    light . 517

Page
Alad island 340
Alambique river 609
Alas bay 347
Alava island 57
Alayao river 521
Albay:
  Gulf 554
    head of 557
  Island 102
  Province 559
Albuquerque town 475
Alcantara village 455
Alciciras island 65
Alegria:
  Town; Cebu 457
  Village; Semirara island. . 325
  Village; Siargao island . . 595
Alert patches 178
Alerta rock 62
Alfred point 145
Alibatan islet 324
Alibihaban island 382
Alibijaban island 382
Alibug point 44
Alibug village 44
Alican point 211
Alice channel 158
  Tidal streams. 159
Alice reef 150
Aligbai island 246
Aligbay island 246
Alikan point 211
Alimanga point 325
Alimango bay 388
Alimono, Mount 471
Alimpaya point. 242
Aling islet. 608
Alipio reef 63
Alisud point 628
Alkisiras island 65
Allard bank 139
Allen town 424
  Light 424
Alligator island 57
Almagro island 420
Almagro town 420
Almeria village 411
Almirante Gil hill 103
Aloguinsan river 453
Aloguinsan town 453
Aloneros town 516
Alonon point 50
Aloran village 489
Alpha shoal 47
Altnacraig shoal 95
Alto point. 550
Alto reef 551
Alutaya reef 493
Amaga islet 607
Amagusan point 587
Amalia islet 525
Amambahag point 412
Amandayehan village. . . . 579
Ambil island 308
Ambil shoal 308
Amblan point 459
  Light 459
Ambolon island 44
Ambolon village 44

Page
Ambugan islet 471
Ambulong:
  Bank 47
  Island 44
    light 45
  Strait 44
  Village 44
Ambutig, Mount 629
Amogotada point; Andis island . 568
Amogotada point; Leyte . . 480
Amoron point 398
Amoyloi:
  Anchorage 234
  Reefs 234
  Village 234
Amparo point 482
Anaganahao island 316
Anahao:
  Island; Pambuhan harbour . 571
  Island; San Juanico strait . 581
  Point 544
  Port, *see* Anajao . . . 545
Anahauan:
  Island; Bukas islands . . 599
  Island; Negros 438
  Point 318
Anahawan village 587
Anajao:
  Island; San Juanica strait . 581
  Island; Sulat bay . . . 566
  Point 544
  Port 545
    anchorage 546
    dangers 545
    directions 546
    light 545
Anajauan island; Bucas islands . 599
Anajauan island; Negros . . 438
Anan hills. 586
Anao islet. 509
Anas islet 86
Anauayan channel 361
Anauayan islet 361
Anchor island 534
Anda reef 345
Anda town 476
Andeyro point 102
Andis island 568
Andrassy, Mount 169
Andulinang islet 149
Anegada rocks 354
Anepahan peaks 92
Angas point 370
Angas village 527
Angosto shoal 248
Anibawan bay 513
Anibong point 579
Anima Sola islet 388
Animosa reef 60
Aniniy town 336
Anipahan peaks. 92
Anitaguipan point 567
Anonang village 556
Anson shoal 503
Antagtacan point 376
Antimonan river 515
Antimonan town 515
Antipolo village 620

Page
Antique:
  Province, 335
  River, 335
  Town, 335
Antoinette, Mount, 179
Antokon island, 598
Antonia islet, 355
Antucao point, 308
Antukao point, 308
Anuling island, 70
Aocon islets, 414
Aokon islets, 414
Apali point, 408
Apali river, 386
Apari rock, 425
Aparri town, 501
  Climatic table, 35
  Radio station, 14
  Storm signals, 11
Apas river, 177
Apat bay, 519
Apat island, 519
Apga point, 349
Apit island, 481
Apiton:
  Cove, 361
  Island, 563
  Mount, 360
  Pass, 361
Apo:
  East pass, 45
    dangers and bank, 45
    directions, 46
  Island; Mindoro strait, 45
    light, 45
  Island; Negros, 441
    light, 441
  Island; Palawan, 100
  Mount, 1, 241, 291
  Reef, 45
  West pass, 46
    islands and dangers, 46
Apo Lambu reef, 191
Apoapuraguan point, 94
Apoapuraguan river, 94
Aporoo islet, 575
Apuao Grande islet, 526
Apuao islet, 526
Apud point, 384
Apud reef, 384
Apulit island, 81
Apunan point, 340
  Light, 340
Araceli:
  Bay, 84
  Point, 84
  Reef, 84
  Town, 84
Arana reef, 345
Arangasa islands, 618
  Light, 619
Arayat shoal, 258
Arboles islet, 294
Arboles point, 458
Arch rock, 545
Arcolon point, 449
Aregita rocks, 340
Arellano village, 590

Page
Arena:
  Island; Palawan, 94
  Island; Sulu sea, 71
  Islet; Burias, 387
  Point; Davao gulf, 300
  Point; Ragay gulf, 382
  Point, Siargao island, 595
Arenas point, 316
Areta shoals, 48
Arevalo bay, 410
Arevalo village, 410
Argao:
  Point, 466
  River, 466
  Town, 466
Argos point, light, 396
Argos reef, 347
Argyll shoal, 98
Ariara island, 63
Aricomo point, 395
Arikomo point, 395
Arkolon point, 449
Armstrong reef, 155
  Light, 155
Aroroi town, 398
Aroroy town, 398
Arrecife:
  Island; Coral bay, 97
  Island; Honda bay, 89
  Island; Island bay, 95
Aru, Tanjong, 139
Asgad point, 572
Asia:
  Bay, 439
  River, 439
  Town, 439
Asid gulf, 348
Aslom islet, 324
Astorga village, 291
Asturias point, 452
Asturias town, 452
Asunciom pass, 444
Ataa islet, 376
Atalaya point, 435
Atjeh rock, 139
Atulayan bay, 553
Atulayan island, 553
Aubarede point, 506
Aubarede reef, 345
Auki island, 606
Auqui island, 606
Aurora, Port, 510
Aurora village, 375
Awasan:
  Bay, 594
  Island, 595
  Point, 387
Ayninan islet, 619
Ayoni bay, 374
Ayukitan town, 459
Ayuquitan town, 459
Azagra town, 343

Baayad point, 68
Babaguan bay, 545
Babaguan village, 546
Babak point, 287

Page

- Baban lagoon 600
- Babas cove 592
- Babatkain point 500
- Babatngon village 581
- Babatnon point 588
- Babayon point 554
- Babayon reef 556
- Babi, Pulau 166
- Babiasan settlement 631
- Babuan islet 208
- Babuyan:
  - Channel 503
    - tidal streams 503
  - Islands 503
  - River 88
  - Village 88
- Bacacay:
  - Mount 525
  - Point 523
  - Town 553
- Bacalan islet 580
- Bacalan point 253
- Bacan island 560
- Bacang bank 63
- Bacaran bay 85
- Bacayauan hills 268
- Bacbac island 54
- Bache reef 59
- Baclayon town 475
  - Light 475
- Baco Chico island 316
- Baco islands 316
- Baco river 315
- Bacol island 581
- Bacolod town 363
- Bacolog islet 264
- Bacon islet 535
- Bacon town 555
- Bacong point 327
- Bacong village 441
- Bacsal islands 414
- Bactol bay 563
- Bactol island 564
- Bacuag river 609
- Bacuag town 610
- Bacud point 282
- Bacud reef 282
- Bacul point 627
- Baculin:
  - Bay 627
  - Point 627
  - Village 627
- Baculud point 553
- Bacung point 198
- Bacungan:
  - Island 250
  - River 89
  - Town 89
- Bacutcut bank 207
- Badi islet 535
- Badian:
  - Bay 455
    - anchorages 456
  - Island 455
  - Islet 414
  - Point; Cebu 455
  - Point; Mindoro 323
  - Town 455
- Badungbadung islet 576

Page

- Baeto point 312
- Bagababoi island 394
- Bagababoy island 394
- Bagabarco point 389
- Bagabarko point 389
- Bagabu islet 360
- Bagacay:
  - Bay 358
  - Island 534
  - Islet 580
  - Point; Cebu 460
    - light 461
  - Point; Mindanao 494
  - Town; Mindanao 494
  - Village; Panay 358
- Bagadamolag islet 383
- Bagadila, Mount 398
- Bagahak:
  - Mount 152
  - Point 153
  - Range 151
- Bagakai:
  - Bay 358
  - Islet 580
  - Point 460
    - light 461
  - Village 358
- Bagakay:
  - Island 534
  - Point 494
  - Town 494
- Bagalamatan village 255
- Bagalangit point 309
- Bagalayag point; Catanduanes island 547
- Bagalayag point; Mindoro 312
- Bagalayog point 390
- Bagaleho point 400
- Bagalejo point 400
- Bagalibas island 580
- Bagamanoc, Port 545
- Bagamanoc town 545
- Bagamanok, Port 545
- Bagambangan island 78
- Bagambanua islet 471
- Baganga:
  - Bay 627
  - River 627
  - Town 627
    - radio station 14
- Baganian peninsula 266
- Baganian river 267
- Bagasaue point 451
- Bagasinan island 622
- Bagasumbut islets 580
- Bagatao island 392
  - Lights 392
- Bagbagan river 231
- Bago river 364
- Bago town 363
- Bagolaya point 520
- Bagolayag point 520
- Bagolibud point 252
- Bagong islet 609
- Bagoso island 626
- Bagtong point 573
- Baguan island 136
- Bagubaut point 399
- Baguio point 505

Page
Bagulaya point 385
Bagulayac point 330
Bagulayak point 330
Bagum islet 601
Bagunbanua island 445
Bagupantao point 346
Bagutayoc point 386
Bagutayok point 386
Bahang channel 203
Bahu, Mount 219
Bai, Pulau 139
Bailan point 339
Baird point 431
Bais:
  Bay 457
    anchorage 459
    directions 459
  Point 298
  Town 458
Bajapa reef 150
Bajukan settlement 631
Bakakai town 553
Bakakay point 523
Bakakay town 525
Bakalan islet 580
Bakalan point 253
Bakan island 560
Bakang bank 63
Bakaran bay 85
Bakbak islet 56
Bakeke islet 206
Baket-baket point 500
Bakiao point 351
Bakies, Tanjong 187
Bakit island 53
Bakkungaan islands 135
Baklayon town 475
  Light 475
Bako Chico island 316
Bako islands 316
Bakol island 581
Bakolod islet 565
Bakolod town 363
Bakolog islet 264
Bakon town 555
Bakong point 327
Baksal cove 299
Baksal islands 414
Bakuag river 609
Bakuag town 610
Bakuhang islet; Darvel bay . 164
Bakuhang islet; Timbu Mata island 163
Bakul point 627
Bakulin, *see* Baculin
Bakulud point 553
Bakung point 198
Bakungan island 250
Bakutkut bank 207
Balabac Great reefs 105
Balabac island; Balabac strait . 103
  Aspect 103
  Channels eastwards of . . 106
  Directions 106
  Eastern side 103
    current 103
  Tidal streams 106
  Western side 105
    dangers 105

Page
Balabac island; Tictauan channel 247
Balabac peak 103
Balabac strait 107
  Current 10
  Dangerous area 108
  Main channel 110
    directions 114
    southern side 113
  Middle channel 109
  Tidal streams 108
Balabac strait, North . . . 101
  Currents, tidal streams . . 102
  Directions 102
Balabac town 103
Balabagan river 274
Balábak, *see* Balabac
Balabao point 348
Balacay island 548
Balading island 418
Balading point 68
Balakay island 548
Balalaki point 421
Balamban:
  Bay 453
    anchorage 453
    directions 453
    light 453
  Point 452
  Town 453
Balambangan island 110
Balanacan, Port 376
  Anchorages 377
  Directions 377
  Islets and dangers . . . 376
  Lights 376
Balanacan village 377
Balanga point 320
Balangan bay 259
  Anchorage 261
Balangasan village 270
Balangona point 540
Balangonan cove 284
Balangonan point 243
Balanguingue island 401
Balanguingui island 222
Balaring point 488
Balas shoal 225
Balatacan point 243
Balatakan point 243
Balatanai islet 232
Balateros cove 314
Balaulan reef 363
Balayan bay 309
  Anchorages 310
Balayan town 309
  Light 309
Balbagon island 355
Baler:
  Bay 509
    anchorages 510
    danger 509
    light 509
  River 509
  Town 509
    radio station 14
Balesin island 514
Balete bay 630
Balete point 315

Page

- Baliangao:
  - Bay . . . 485
  - Point . . . 486
  - Town . . . 485
- Balicao point . . . 68
- Balicaocao point . . . 489
- Balicasag island . . . 474
  - Light . . . 474
- Balicuatro islands . . . 429
- Balicuatro point . . . 428
- Baligian bay . . . 243
- Baliguian islet . . . 360
  - Light . . . 360
- Balikao point . . . 68
- Balikaokao point . . . 489
- Balikasag island . . . 474
  - Light . . . 474
- Balimbing:
  - Channel . . . 202
  - Point . . . 201
  - Village . . . 201
- Balinatio island . . . 574
- Balingasag bay . . . 494
- Balingasag town . . . 494
- Balingauan point . . . 318
- Balingawan point . . . 318
- Balinguan village . . . 494
- Baliog point . . . 85
- Baliscan islet . . . 516
  - Light . . . 516
- Baliskan islet . . . 516
  - Light . . . 516
- Baliuagan river . . . 453
- Baliungan island . . . 201
- Balocbaloc point . . . 528
- Balokbalok point . . . 528
- Balolo point . . . 52
- Balseiro point . . . 221
- Balseyro channel . . . 202
- Baltasar island . . . 378
  - Light . . . 378
- Baltimore peak . . . 508
- Baluagan river . . . 318
- Baluarte point . . . 413
- Baluk river . . . 177
- Baluk Sampan, Mount . . . 199
- Balukbaluk island . . . 226
- Balung river . . . 177
- Balusingan bay . . . 426
- Balusuan islet . . . 163
- Balut island . . . 285
  - Light . . . 285
- Bambagan reef . . . 212
- Bambannan island . . . 192
- Bambanon islet . . . 469
- Banacboc village . . . 525
- Banacon islet . . . 469
- Banahao, Mount . . . 369
- Banakon islet . . . 469
- Banaran island . . . 203
- Banate bay . . . 362
- Banate town . . . 362
- Banbayan point . . . 494
- Bancal bay . . . 357
- Bancal point . . . 43
- Bancalan island . . . 100
- Bancalayot islet . . . 414
- Bancaobancao, Mount . . . 224
- Bancaobancao point . . . 90

Page

- Bancauan islet . . . 72
- Banco point . . . 257
- Bancoran island . . . 71
- Banculin point . . . 620
- Bancungan island . . . 219
- Bancuyo island . . . 601
- Banda reef . . . 188
- Bandai village . . . 483
- Banday village . . . 483
- Bandayanon point . . . 549
  - Light . . . 549
- Banga:
  - Point . . . 242
  - Port . . . 251
    - anchorage . . . 251
    - dangers . . . 251
    - directions . . . 251
  - Tanjong . . . 73
- Bangaan island . . . 251
- Bangad river . . . 348
- Bangai point . . . 626
- Bangalao island . . . 221
- Bangalao village . . . 221
- Bangtad point . . . 448
- Bangud islet . . . 340
- Banguey:
  - Island . . . 113
    - aspect . . . 113
    - islands and dangers eastward of . . . 115
  - Outer N.E. reefs . . . 114
  - Patches, East . . . 115
  - Peak . . . 113
  - South channel . . . 116
    - beacons . . . 116
    - dangers in N. and E. approaches . . . 119
    - directions . . . 120
    - islands and dangers . . . 116
  - West channel . . . 112
    - beacon . . . 112
    - dangers . . . 112
    - directions . . . 113
- Bangui bay . . . 499
- Bangui town . . . 500
- Bani:
  - Channel . . . 429
  - Island . . . 430
  - Islands . . . 533
- Baniaga reef . . . 45
- Baniaga rock . . . 45
- Banilad shoals . . . 461
- Bankal bay . . . 357
- Bankal point . . . 43
- Bankálan island . . . 99
- Bankalayot islet . . . 414
- Bankari point . . . 564
- Bankauan islet . . . 72
- Bankauhang islet . . . 163
- Bankawan:
  - Channel . . . 118
  - Island . . . 115
  - Pulau . . . 137
  - Reefs . . . 115
- Bankoka hill . . . 129
- Bankoron island . . . 71
- Banku ru an cays . . . 133
- Bankulin point . . . 620
- Bankungan island . . . 219

Page
Banla point 513
Banlas point 458
Banluto islet 597
Banogai islet 353
Banogay islet 353
Banos point 284
Banot islands 379
Bantac island 47
Bantak island 47
Bantayan:
  Bay 433
  Hill 329
  Island 445
  Light 446
  Town 446
  Village 433
Bantigui:
  Islet; Bohol 469
  Islet; Jintotolo channel . . 355
  Islet; Mindanao 495
  Point; Cebu 449
  Point; Iloilo strait. . . . 367
  Point; Panlatuan, Port . . 391
  Point; Tayabas bay . . . 369
  Rocks 367
Bantolinao point 460
  Light 461
Bantolinos islets 227
Banton island 328
Bantoncillo island 328
Bantuin point 385
Bantulin point 404
Banug:
  Islet 611
  Point 413
  Strait 611
Bao river 403, 479
Baohan islet 565
Baong rocks 593
Baquiao point 351
Baquit island 53
Barabod point 562
Barangonan island 78
Barao reef 558
Bararin island 67
Baras, Port 275
Baras town 549
Barbacan range. 87
Barbakan range. 87
Barbasa town 335
Barcelona town; Bislig bay . 625
Barcelona town; Luzon . . 426
Barceloneta village . . . 529
Barili bay. 454
Barili town 454
Baring, Mount 86
Barong Barong point . . . 105
Baronto eilandje 303
Barotac bay 362
Barotac river 362
Barotac Viejo village . . . 362
Barotak bay 362
Barotak river 362
Barotak Viejo village . . . 362
Barrabas reef 601
Barracuda reef 95
Barranca point 87
Barraut reef 126
Barrel rock 274

Page
Barrera, Port 398
  Anchorages 399
  Buoys 398
  Dangers 398
  Light 398
Barselisa island 63
Barugo town 413
Baruyan river 315
Basaan islet 469
Basan reef 250
Basay village 439
Basbas:
  Channel. 204
  Island; Pangutarang group . 191
  Island; Tawitawi island. . 204
  Point 213
Basco reef. 63
Base rock 63
Basei river 575
Basei town 575
Basey river 575
Basey town 575
Basiad bay 520
Basiao channel 468
Basiao islands 415
Basiauan bay 287
Basiauan village 288
Basiauang bay 280
Basiauang point 280
Basibuli islands 203
Basibuli reef 202
Basilan island 229
  Northern side. 234
  Southern and south-eastern sides 234
  South-western side 229
    dangers 229
    islets 229
  Western side 230
    dangers 230
    islets 230
Basilan peak 229
Basilan point 230
Basilan strait 237
  Buoys 238
  Climate and weather . . . 16
  Islands and dangers . . . 238
  Lights 238
  Northern side. 239
  Southern side. 234
  Tidal streams. 237
  Tides 237
Baslay islet 401
Baslay reef 401
Basol island 614
Basol islet. 287
Basot island 536
Bassa point 294
Basterra reef 71
Basun channel 198
Basun Dakula island . . . 198
Basun Sibi Sibi island . . . 198
Bat islet 431
Batabuan point. 60
Batag island 434
  Light 435
Batalampon point 241
Batan:
  Harbour 556
    beacons 556

Page
Batan—*contd.*
  Island . . . 551
  Point . . . 350
  Port . . . 350
    anchorage . . . 350
    buoys . . . 350
    directions . . . 350
    light . . . 350
    off-lying shoals . . . 350
  Village; Batan harbour . . . 556
  Village; Batan, Port . . . 350
Batangas bay . . . 311
  Anchorages . . . 311
  Communication . . . 312
  Light . . . 312
  Radio station . . . 14
Batangas town . . . 311
Batarya point . . . 327
Batas island . . . 79
Batauang river . . . 452
Batbatan island . . . 334
Batbatan village . . . 334
Bate channel . . . 101
Batgongon island . . . 419
Bati, Pulau . . . 163
Bati Laut, Pulau . . . 163
Batiano point; Pujada bay . . . 630
Batiano point; Tablas island . . . 330
Batikual point . . . 297
Batinao point . . . 628
Bato:
  Point . . . 300
  River . . . 543
  Town; Catanduanes island . . . 543
  Town; Leyte . . . 481
Batobato point . . . 538
Batolaki bank . . . 215
Batolaqui bank . . . 215
Batotindoc point . . . 242
Batotindok point . . . 242
Battang point . . . 111
Batu, Tanjong; Marudu bay . . . 126
Batu, Tanjong; Silam harbour . . . 165
Batu Batu bay . . . 200
Batu Batu town . . . 200
Batu Batu, New . . . 200
Batu Manoyak point . . . 265
Batu Tinagat . . . 177
Batu Tinagat hills . . . 178
Batuan bay . . . 395
Batuan town . . . 395
Batuanan, Mount . . . 477
Batuecas, Port . . . 598
Batuecos, Port . . . 598
Batulayol point . . . 286
Batulinao point . . . 501
Batupare point . . . 234
Baturapac island . . . 205
Baturua reef . . . 159
Bauan town . . . 311
Baubaon point . . . 487
Baug river . . . 498
Baug village . . . 497
Baugan bay . . . 500
Baul islet . . . 574
Baverstock point . . . 220
Bay peak . . . 87
Bay point . . . 92
Bayaca islet . . . 60

Page
Bayaka islet . . . 60
Bayagnan island . . . 612
Bayan, Pulau . . . 167
Bayang islet . . . 362
Bayang, Mount . . . 362
Bayas islets . . . 358
Bayauan river . . . 439
Baybay:
  Mount . . . 217
  Point . . . 400
  Town . . . 480
    light . . . 480
Bayuan bay . . . 60
Beacon rocks . . . 58
Beaufort, Mount . . . 90
Beaufort reef . . . 170
Becebos bay . . . 609
Bedal point . . . 384
Bedonogan cove . . . 547
Beelzebub reef . . . 615
Beeston, Mount . . . 158
Belan point . . . 217
Bello, Port . . . 479
Beluran settlement . . . 137
Benagalet point . . . 309
Benito shoal . . . 78
Benkoka islet . . . 123
Benkoka river . . . 123
Bennet reef . . . 345
Bera bank . . . 78
Berhala island . . . 138
Berrugosa point . . . 588
Bershesherk patch . . . 156
  Beacon . . . 156
Bessie island . . . 95
Beta reef . . . 346
Beta shoal . . . 59
Beyobo channel . . . 600
Biaringan island . . . 339
Biasong village . . . 480
Bicobian, Port . . . 506
Bicol river . . . 1, 529
  Light . . . 529
Bicol rock . . . 527
Bidoos bay . . . 327
Big Cruz island . . . 295
Bigaan river . . . 624
Bihintinusa channel . . . 225
  Tidal streams . . . 226
Bihintinusa island . . . 225
Biking, Mount . . . 473
Bikobian, Port . . . 506
Bikol river . . . 1, 529
  Light . . . 529
Bikol rock . . . 527
Bilaa point . . . 498, 612
Bilaa shoal . . . 614
Bilabid island . . . 612
Bilabid point . . . 592
Bilanbilan bay . . . 613
Bilanbilan village . . . 613
Bilanbilangan islet . . . 469
Bilangan island . . . 193
Bilatan island . . . 202
Bilbao, Mount . . . 552
Bilbogan, Mount . . . 298
Biliran island . . . 411
  Northern and eastern sides . . . 412
    islets and dangers . . . 412

Page
Biliran island—*contd.*
  Western side . . . 411
    anchorages . . . 412
    islets and dangers . . . 411
Biliran strait . . . 412
  Anchorages . . . 413
  Beacon . . . 412
  Directions . . . 413
  Light . . . 412
Biliran town . . . 413
Billean:
  Island . . . 132
  North dangers . . . 132
  South dangers . . . 133
Biloc Biloc reef . . . 202
Bilok Bilok reef . . . 202
Biluga point . . . 311
Bimau, Tanjong . . . 187
Binabasalan islet . . . 574
Binaca, Mount . . . 277
Binagasbasan bay . . . 534
Binagon point . . . 341
Binahian village . . . 385
Binaka, Mount . . . 277
Binalabag island . . . 58
Binalbagan:
  Point . . . 555
  River . . . 436
  Town . . . 436
Binalio islet . . . 420
Binalio point . . . 420
Binaliu rocks . . . 590
Binanan island . . . 360
Binarayan island . . . 562
Binarera point . . . 39
Binatac point . . . 579
Binatak point . . . 579
Binatican island . . . 81
Binatikan island . . . 81
Binga island . . . 80
Bingad island . . . 614
Bingai islet . . . 427
Bingai point . . . 426, 554
Bingay islet . . . 427
Bingay point . . . 426, 554
Bingcay point . . . 404
Bingkai point . . . 404
Binigsian point . . . 437
Binit point . . . 483
Binobolang point . . . 481
Binongkalan point . . . 403
Binongkalan village . . . 403
Binorong point . . . 548
Bintacan, Mount . . . 393
Bintakan, Mount . . . 393
Bintoulan island . . . 207
Bintut islet . . . 74
Binugayan bay . . . 564
Binugayan point . . . 564
Binulbulan island . . . 78
Binulin river . . . 293
Binuluangan island . . . 357
Binuni point . . . 490
Binunsalian bay . . . 92
Binuntuan point . . . 582
Binurun point . . . 548
Bird islet . . . 86
Birds' Nest caves . . . 165

Page
Biri:
  Channel . . . 429
  Head . . . 429
  Island . . . 429
Bislig:
  Bay . . . 624
    anchorages . . . 624
    dangers . . . 624
    directions . . . 624
  Point . . . 542
  River . . . 624
  Town . . . 624
Bisu Bintut islet . . . 74
Bisu Bohan islet . . . 74
Bisucay channel . . . 67
Bisucay island . . . 67
Bisukai channel . . . 67
Bisukai island . . . 67
Bitaogan:
  Mount . . . 329
  Point; Catanduanes island . . . 548
  Point; Davao gulf . . . 299
  River . . . 299
Bitaugan bay . . . 618
  Anchorage . . . 619
  Dangers . . . 618
  Directions . . . 619
  Light . . . 618
Bitaugan village . . . 618
Bitinan island . . . 221
Bitogan point . . . 612
Biton bay; Luzon . . . 394
Biton bay; Ticao . . . 396
Biubugnan, Mount . . . 213
Bivouac point . . . 94
Black islet . . . 535
Black rock; Libarran island . . . 136
Black rock; Ticao . . . 396
Black Rock channels . . . 397
Black Rock pass . . . 396
  Tidal streams . . . 397
Black Watch rock . . . 113
Blake reef . . . 149
Blanca point; Luzon . . . 499
Blanca point; Mindanao . . . 245
Blanca point; Panay . . . 357
Blik, Mount . . . 277
Bluff point . . . 249
Boaan island . . . 135
Boac river . . . 377
Boac town . . . 377
Boak river . . . 377
Boak town . . . 377
Boaya point . . . 315
Bobon:
  Islet . . . 608
  Point; Mindanao . . . 629
  Point; Samar . . . 431
  River; Mindanao . . . 610
  River; Samar . . . 431
  Town . . . 431
  Village . . . 610
Boca:
  Islets . . . 389
  Point . . . 389
  Reefs . . . 270
Boca Engaño, Port . . . 390
  Anchorage . . . 390
  Directions . . . 390

Page

- Bocana bay 547
- Bocao point 47, 51
- Bocboc point 370
- Bocot islet 359
- Bogio point 312
- Bognao inlet 44
- Bogo:
  - Bay 405
    - anchorage 406
    - beacons 405
    - light 405
  - Shoal 462
  - Town 405
- Bogton point 45
- Bogtongan islets 48
- Bogui point 529
- Bohan island 74
- Boheian island 158
- Bohi dulong island 160
- Bohihan island 164
- Bohol island 468
  - Eastern side 476
  - Northern side 468
    - off-lying islands and dangers 469
  - North-western and western sides 471
  - Southern side 474
- Bohol settlement 85
- Bohol strait 472
- Bojeador, Cape 499
  - Light 499
- Bojelebung channel 235
- Bojelebung town 235
- Bokao point 47, 51
- Bokbok point 370
- Bokot islet 359
- Bolaboc point 343
- Bolabok point 343
- Bolai, Port 286
- Bolanon river 443
- Bolay, Port 286
- Bolbok town 369
- Bold point 88
- Bolhoon town 467
- Bolila island 439
- Bolila point 439
- Bolina island 63
- Bolipongpong point 213
- Boljoon town 467
- Bolo rock 418
- Boloang island 418
- Bolobolo point 483
- Bolod islands 224
- Bolod village 474
- Bolodbolod point 225
- Bolos point 505
- Bolton reef 289
- Bolton village 289
- Bombon, Mount 67
- Bombon point 340
- Bonbon town 494
- Bonbonon point 440
- Bonbonon, Port 440
  - Anchorage 440
  - Directions 440
- Bondoc:
  - Head 376
  - Peninsula 373
    - western side 373
  - Point 374

Page

- Bondok:
  - Head 376
  - Point 376
  - Village 375
- Bondulan point 337
- Bonga island 611
- Bongabong village 320
  - Light 320
- Bongao:
  - Channel 147, 196
  - District 148
  - Island 147
  - Peak 196
  - Port 195
    - anchorages 196
    - dangers 195
    - directions 196
    - light 196
  - Radio station 14
  - Village 197
- Bongaya river 136
- Bongo island 272
- Bongo shoal 273
- Bonobono settlement 96
- Bonoon islet 468
- Bontoc, Mount 480
- Bontoc village 483
- Bontok, Mount 480
- Boombong island 70
- Borac, Port 50
- Borak, Port 50
- Borbon town 402
- Borigay point 542
- Borneo:
  - General remarks 5
  - North-eastern side 127
- Borneo bank 109
- Borneo, North:
  - Communications 6
  - Currency 6
  - Government 5
  - Harbours 5
  - Trade 6
  - Weights and measures 6
- Borneo rock 139
- Borneo shoal 114
- Bornugus, Tonjong 122
- Borobaloto rock 418
- Borocay island 332
- Borokai island 332
- Borongan:
  - Port 568
    - anchorages 569
    - dangers 568
    - directions 569
    - lights 568
  - River 568
  - Town 568
- Borot:
  - Cove 298
  - Point 298
  - Reef 298
- Boso Dohonan rocks 205
- Boston village 626
- Botak point 287
- Botetian, Mount 263
- Botikis island 446
- Botinagan bay 547
- Botiquis island 446

Page
Botlog islet 360
Botogan point 246
Botong island 446
Bototindok point 242
Bowen islet 100
Brandon reefs 126
Breeches shoal 262
Brother islands 77
Brutus reef 228
Bu-a-ning cay 130
Buad channel 415
Buad island 414
Bual point 282
Bualan river 264
Buan:
  Bay 201
  Island 201
  Point 629
Buansa shoal 217
Bubuan:
  Island; Jolo group. . . 218
  Island; Tapiantana group . 225
  Island; Tawitawi group . . 209
  Village 209
Bubuday river 268
Bubug point 41
Buca point 263
Bucagan hill 491
Bucas:
  Cove 601
  Island, East 597
  Island, Middle 597
  Point 601
Bucas Grande island 598
Bucutua island 223
Bud Bas, Mount 197
Bud Butua, Mount 197
Bud Luuk. 200
Bud Sikala 200
Bud Sitingan 201
Budias point 552
Budlaan islet 468
Buenavista:
  Town; Guimaras island . . 338
  Village; Hikdop island . . 615
  Village; Marinduque . . 378
  Village; Mindanao. . . 606
Buford reef 275
Buga rock. 420
Bugan river 333
Bugao point 544
Bugho point 586
Bugo village 493
Bugol point 320
Bugsanga point 41
Bugsanga river 41
Bugsok rock 264
Bugsuk island 100
Bugsuk river 100
Bugton point; Albay gulf . . 551
Bugton point; Mindoro . . 321
Bugtu point 432
Bugtu river 432
Bugtung island 401
Buguey river 502
Buguey village 501
Bugui point 345
  Light 346
Buguias islet 553
Buguitai islet 513
Bugut Lapit point 198
Buhangin village 383
Buho islet. 398
Buhoc point 411
Buhok point 411
Buka point 263
Bukas, *see* Bucas
Bukat island 187
Bukid point 284
Bukit = Hill, *see* proper name
Bukutua island 223
Bula shoal. 324
Bulacaue point 349, 353
Bulakaue point 349
Bulalacao:
  Bay 323
  Island 59
  Town 323
Bulalakao, *see* Bulalacao
Bulalaki point 406
Bulalaqui point 406
Bulalo point 485
Bulan:
  Island 223
  Peak 223
  Town 393
    light 393
Bulanhau range 97
Bulanjao range 97
Bulasan point 209
Bulatakay river 289
Bulato point 485
Bulawan point 62
Bulias shoal 495
Bulicutin island 220
Bulilacat point 209
Buliluyan, Cape. 98
Bulingis, Tanjong 75
Bulipatuid shoal 160
Bulisulat reef 222
Bulitalun point 222
Bulitun island 213
Bulog point 60
Buluan:
  Island 253
  River 253
  Village 253
Buluang point 44
Buluang village 54
Bulubadian point 438
Bulubadiangan islet . . . 360
Bulubugan point 453
Bulubulu islet 149
Buluguisan point 438
Bulusan:
  Point 271
  Village 426
  Volcano. 426
Bulutbulibato, Mount. . . . 225
Bum-Bum island 159
  Dangers. 159
  Islands and dangers N. and E. of 159
Bum Bun river 123
Bunauan river 295
Bunay Bunay islet 201
Buncayao point. 352
Bunga:
  Cove 628

Page
Bunga—*contd.*
  Creek 628
  Point ; Jolo island . . . 214
  Point ; Samar . . . 563
Bunkayao point . . . 352
Bunotpasil island . . . 222
Buntai islet 415
Buntay islet 415
Buntay point, light . . . 446
Buntud reef 400
Bunubog point 394
Buoy rock. 104
Buoyage, Philippine islands. . 3
Bura point 571
Burabud point 410
Burayoc point 499
Burayok point 499
Burdeos bay 513
Burgos village 616
Burgur island 57
Buri :
  Island ; Samar . . . 417
  Islet ; Ambulong island . . 44
  Islet ; Panay 361
  Point ; Masbate . . . 348
  Point ; Ragay gulf . . . 385
Burias :
  Island 387
    eastern side. 389
    off-lying islands and dangers. 387
    western side 388
  Pass 390
  Reef 299
Burobodiongan point . . . 424
Burs huk 179
Buruanga river 333
Buruanga village . . . 333
Buruncan peninsula . . . 324
Buruncan point 44, 324
Burungan island . . . 425
Burunkan point. . . . 38
Busai, Mount 414
Busainga, Port 389
Busan bay 252
Busay, Mount 414
Busbus point 211
Bush island ; Borneo . . . 129
Bush island ; Palawan . . 89
Busin island 388
Busin, Port 388
  Anchorage 388
  Directions 388
Busluc point 210
Busson rock 217
Busuanga island . . . 48
  North-eastern side . . . 48
    anchorages 48
    off-lying islands and rocks . 49
  Southern side 51
    off-lying islands and dangers. 51
  Western side 54
    off-lying dangers . . . 54
Busuanga river 55
Busuanga town 55
Butag bay. 394
Butag village 394
Butakalut shoal. . . . 223
Butan islet 469
Butauanan bay 530

Page
Butauanan island . . . 531
Buti hill 550
Butong point 520
Buttun, Point 110
Butuan bay 496
Butuan town 498
Butulan cove 284
Buyallao :
  Island 322
  Pass 322
  Peninsula 322
  Point 322
Byan island 100
Byby island 610

Caaluhan river 528
Cabacujan point . . . 347
Cabadbaran river . . . 498
  Light 498
Cabadbaran town . . . 498
Cabadea point 555
  Light 557
Cabahan island 342
Cabalarian islet 574
Cabalata, Mount . . . 271
Cabalete island 516
Cabalian :
  Banks 332
  Bay 587
  Mount 587
  Point ; Jolo island . . . 215
  Point ; Tablas . . . 330
  Town 587
Cabalic point 337
Caban islet 310
Cabancauan island . . . 198
Cabantian point. . . . 476
Cabantulan islet. . . . 469
Cabarasan point. . . . 574
Cabarian point 383
Cabaun island 431
Cabay bay 569
Cabay village 570
Cabayan point 631
Cabgan :
  Island ; Mindanao . . . 610
  Island ; Palompon, Port . . 409
  Island ; San Miguel bay . . 529
  Islands ; Murcielagos bay . 485
  Islet ; Lianga bay . . . 621
Cabicungan river . . . 500
Cabilan islets 594
Cabilao island 472
Cabilauan island ; Busuanga island 49
Cabilauan island ; Coron passage. 52
Cabilison island 421
  Light 421
Cabingaan island . . . 213
Cabiyangan point . . . 453
Cablagna point 575
Caboang bay 103
Cabodiangan point . . . 342
Cabog :
  Island ; Tungauan bay . . 250
  Islands ; Dumanquilas bay . 264
  Islands ; Taba bay . . . 256
  Point 255

Page
Cabra island 306
  Light 306
Cabra point 563
Cabuang point 495
Cabucan island 218
Cabug point 322
Cabugan Chico island . . . 586
Cabugan Grande island . . . 586
Cabugan islands ; Coral bay . 97
Cabugan islands ; Surigao strait . 586
Cabugao :
  Bay 543
    anchorages 544
    dangers 543
    directions 544
    light 543
  Island 626
  Islet ; Jintotolo channel . . 355
  Point 368
  Village 543
Cabulan islet 470
Cabulao bay 477
Cabulao point 476
Cabulauan island 64
Cabuli island 77
Cabuli point 77
Cabulig bay 493
Caburauan, Mount 384
Cabusao village 529
Cabut island 257
Cabutunan point 505
Cacatan island 208
Cacayaren island 57
Cacayatan island 63
Cacbucao islet 84
Caceres village 467
Cadacan river 583
Cadiz :
  Point 280
  River 443
  Town 443
Caduayan village 220
Cadulan point 396, 400
Caduruan point 348, 401
Cagamutan bay 562
Cagaray islet 549
Cagaray point 549
Cagayan :
  Anchorage 493
    buoy 493
    light 493
  Island 70
  Islands 70
    dangers north-eastward of . 70
  River ; Luzon . . . 1, 501
    anchorages 501
    buoy 501
    light 501
  River ; Macajalar bay . . 493
  Town 493
Cagayan Sulu group 73
  Anchorages 74
  Banks 73
  Tidal streams 75
Cagayan Sulu island 73
  Light 73
  Radio station 14
Cagayancillo village 70
Cagbanlio point 574

Page
Cagbatan island 52
Cagbinunga island 534
Cagbulauan island 552
Cagdanao :
  Island ; Linapacan island . . 62
  Island ; Shark Fin bay, N.E. approach 78
  Island ; Shark Fin bay, S.E. approach 80
  Island ; Taytay bay, S. approach 83
Cagdullon islands 417
Cagmanaba bay 383
Cagnipa island 429
Cagosoan point 584
Cagraray :
  Island 552
  Pass 552
  Point 555
Cagsao point 529
Caguait harbour 618
Caguait village 618
Caguray :
  Point 43
  River 43
  Village 43
Cahayagan island 434
Caibiran town 412
Caima bay 385
Cain reef 481
Cajagnaan town 481
Cajidiocan town 344
  Radio station 14
Cajoagan island 433
Cajui reef 42
Calaba islet 371
Calabadian island 82
Calabagio island 541
Calabago point 341
Calabazas island 362
  Light 362
Calabucay island 83
Calabugdong island 80
Calagcalag bay 456
Calagcalag village 456
Calagnaan island 357
Calagua islands 524
Calaguan island 414
Calagusang point 234
Calaitan channel 207
Calaitan islets 207
Calalanag island 521
Calalayuan point 42
Calalong island 70
Calambayanga island 522
Calamian group 48
Calancan bay 378
Calandagan island 86
Calandorang bay 103
  Anchorage 104
  Directions 104
  Light 104
Calangaman islet 405
Calanhayaun island 47
Calantas rock 425
  Light 425
Calapan :
  Bay 315
  Islet 435
  Point 315

	Page
Calapan—*contd.*	
Town	315
light	316
Calape bay	471
Calape town	471
Calasag bay	85
Calasag point	85
Calatagan point	306
Calaton point	342
Calatrava river	449
Calatrava town	449
Calauag:	
Bay; Luzon	518
Bay; Palawan	83
Town	518
Calauit bay	49
Calauit village	49
Calavite, Cape	38
Light	38
Calavite, Mount	38
Calaylayan bay; Linapacan island	62
Calaylayan bay; Luzon	372
Calayuan point	425
Calbayog river	418
Calbayog town	418
Calbiga river	416
Calbiga town	415
Caldera bay	239
Caldera point	239
Calian point	285
Calianan shoal	575
Calibang island	64
Calibon point	270
Calibugon hill	96
Calicoan island	572
Calicoan pass	572
Calida village	260
Caligangan point	483
Caliling town	437
Calintaan island	425
Calipapa village	439
Calipipit island	58
Calis point	51
Calitan point	60
Calituban islet	469
Calituban reef	469
Calolbon town	542
Light	542
Calomutan, Mount	394
Calongcalong point	442
Caltagan island	582
Caltom, Port	49
Calubcub point	363
Calubian village	411
Calug point	252
Calumbagan island	59
Calumbuyan island	56
Calumpan peninsula	309
Calumpan river	311
Calumpijan islet	413
Calunangan point	408
Calupag island	206
Calusa island	71
Calutan islet	411
Caluya island	326
Caluya town	326
Calva island	201
Calver point	93
Camagong, Mount	516
Camalaniugan village	501
Camandag island	421
Camanga island	46
Camansi point	631
Camarines Norte province	2
Camasusu island	347
Cambacamba channel	207
Cambalaguio point	478
Cambalo point	344
Cambalo town	344
Cambaloi islet	418
Cambalot reef	415
Cambanog shoal	363
Cambari island	84
Cambasac point	601
Cambasac village	601
Cambasingan islet	574
Cambatutay bay	417
Cambia point	421
Cambidsos rocks	419
Cambuang hill	455
Cambulayan point	342
Cambulong point	258
Camerong river	312
Camiguin island; Babuyan islands	503
Camiguin island: Mindanao	494
Caminawit point	42
Light	42
Camiris point	577
Camoropudan islets	576
Camotes islands	407
Anchorages	407
Tidal streams	408
Camp Overton	491
Campanario shoal	462
Campatoc point	406
Campatoc reef	406
Campomanes bay	438
Campopo bay	410
Campoyo point	457
Camtas point	39
Camugan island	250
Camungi islet	470
Canaba point	478
Canabayon island	562
Canabungon island	100
Canabungan river	230
Canaguayan islet	423
Canaguayan point	409
Canahauan Daco island	418
Canahauan islands	418
Canal bay	610
Canalizo strait	254
Canamay point	457
Canapauan, Mount	504
Canapiag point	340
Canapog point	409
Canaron island	64
Cañas:	
Bay	362
Island; Basilan island	229
Islet; Panay	357
Shoal	229
Canatonatoan, Mount	398
Canauay island	581
Light	581
Canauay reef	427
Canauayan point	414
Canauayor anchorage	494

Page
Canauayor islet . 494
Canaway river . 440
Cancabato bay . 577
Cancuman island . 229
Candaraman inlet . 102
Candaraman island . 102
Candaya town . 447
Candolu island . 572
Candongos reef . 417
Candos bay . 609
Candungao, Mount . 471
Cangan point . 254
Cangom islet . 580
Cangouac point . 343
Canigao channel . 481
  Buoys . 481
  Danger . 481
Canigao island . 481
  Light . 481
Canigaran village . 91
Caniguin point . 483
Canim, Mount . 486
Canimeran islet . 99
Canimo island . 526
  Light . 526
Canimo pass . 527
Caninoan islet . 574
Canipan reef . 281
Canipo island ; Culion island . 58
Canipo island ; Cuyo group . 67
Canipsan village . 318
Canitauan island . 53
Canlaon volcano . 436
Canloay point . 344
Canmamot island . 418
Canmanai rocks . 561
Canmanoc, Mount . 472
Cannomanda point . 567
Canoan, Port . 478
  Anchorage . 478
  Directions . 478
  Lights . 478
Canopao point . 475
Cansaga bay . 460
Cansilan point . 439
Cantagay point . 475
Cantamulig hill . 470
Cantilan :
  River . 605
  Shoals . 605
  Town . 605
Cantingas point . 343
Canton island . 526
Canyayo point . 331
Caohagan islet . 470
Cap island . 191
Capalonga bay . 520
  Light . 521
Capalonga town . 520
Capaquian island . 594
Caparan village . 253
Capare island . 54
Capayas :
  Islet . 487
  Reef . 85
  Village . 85
Capid point . 331
Capinas point . 568
Capines point . 574

Page
Capitancillo islet . 404
  Light . 405
Capiyaan islet . 602
Capiz :
  Bay . 351
    lights . 351
  Province . 351
  Town . 351
Capnoyan island . 68
Capocpocanan island . 571
Caprangasan island . 418
  Light . 418
Capual channel . 221
Capual island . 221
Capul :
  Island . 422
  Pass . 423
  Town . 422
Capulaan bay . 370
Capuluan point . 386
Capuluan reef . 386
Capulutan, Mount . 505
Capulutan point . 505
Capungun peninsula . 605
Capungun point . 604
Capuntucan point . 558
Caraballo mountains . 500
Carabang island . 385
Carabao island . 332
Carabao rock . 309
Carabuca point . 263
Caracapan islets . 580
Caraga :
  Bay . 628
  River . 628
  Village . 628
Caramay :
  Bay ; Green Island bay . 87
  Bay ; Palawan . 95
  Harbour . 87
  River . 95
  Settlement . 87
Caramoan :
  Peninsula . 536
  Point . 538
  Port . 538
  Town . 538
Caramoran town . 542
Carangian channel . 431
Carangian village . 431
Carauisan point . 39
Carbin reef . 444
Carcar :
  Bay . 466
  Point . 465
  Town . 466
Caridad village ; Lanuza bay . 604
Caridad village ; Siargao island . 595
Carigan point . 478
Carigara bay . 413
Carigara town . 413
  Light . 413
Caringo island . 527
Carles village . 353
Carlota island . 327
Carmelo point . 452
Carmen :
  Bank . 334
  Bay . 339

Page

- Carmen—*contd.*
  - Point 197
  - Port 403
  - Shoals 443
  - Town 403
- Carmencita shoal 357
- Carnasa island 356
- Carogo island 347
- Caromata bay 277
- Carrascal:
  - Bay 606
  - River 606
  - Village 606
- Carrasco reef 345
- Carrington reefs 118
- Carroll point 185
- Cartagena bay 438
- Cartagena town 438
- Casameyon point 389
- Casapao, Mount 310
- Casapsapan bay 507
- Casauman point 629
- Casauman river 628
- Casian island 80
- Casian village 80
- Casiguran:
  - Bay 508
  - Sound 508
    - anchorages 509
    - current 509
    - directions 509
    - tidal streams 509
  - Town; Casiguran bay 509
    - radio station 14
  - Town; Sorsogon bay 393
    - light 393
- Casimon point 451
- Casirahan islet 86
- Casogoron bay 584
- Casolgan pass 552
- Castilla, Port 597
- Castilla town 393
  - Light 393
- Castillo point; Boca Engaño, Port 390
- Castillo point; Honda bay 88
- Castle island 82
- Casuarina point 94
- Casul bay 485
- Casulian island 597
- Catabangan:
  - Bay 386
  - River 386
  - Village 386
- Catadman point 403
- Cataingan:
  - Port 401
  - Tetas de 401
  - Town 401
- Cataisan point 576
- Catakian Chica islet 514
- Catakian Grande island 514
- Catalaban island 566
- Catanaguan island 539
- Catanauan:
  - Bay 374
  - River 374
  - Town 374
    - light 374

Page

- Catanduanes island 539
  - Eastern side 544
  - Northern side 539
  - Southern side 542
    - light 542
    - off-lying dangers 543
  - Western side 540
- Catarman:
  - Anchorage 625
  - Point; Camiguin island 494
  - Point; Leyte 480
  - Point; Mindanao 625
  - Shoal 432
  - Town 432
- Catbalogan:
  - Anchorage 416
    - anchorage 416
    - buoys 416
    - dangers 416
    - directions 416
    - light 416
  - River 416
  - Town 417
    - radio station 14
    - storm signals 11
- Catbatan point 398
- Catbatan rock 398
- Cateel:
  - Bay 626
  - River 626
  - Town 626
- Catimogan shoals 70
- Catinic point 578
- Catiyoman point 408
- Catmon:
  - Bay 439
  - Hill 583
  - Point; Cebu 403
  - Point; Negros 438
  - Town 402
- Catpatin island 397
- Catubeg reef 558
- Catubig river 433
- Catubig town 433
- Catundulan point 390
- Cauayan:
  - Islet 86
  - Point 580
  - Town 437
  - Village 467
- Caubyan islets 469
- Cauit:
  - Bank 604
  - Island; Cebu, Port 462
    - anchorage 463
    - obstructions 463
    - quarantine station 462
  - Island; San Miguel bay 529
  - Point; Albay gulf 555
  - Point; Cebu 447
  - Point; Mindanao, east coast 604
    - light 604
  - Point; Mindanao, west coast 242
  - Point; Sibuyan 343
  - Point; Tablas 330
  - Reefs 557
  - Village 447
- Cauitan point 439
- Caunbalan point 384

Page
Caurusan point 384
Caution point 184
Cave point 430
Cavili island 71
Cavite village 485
Cawayan town, light 432
Caxisigan island 102
Cayangon point 467
Caye island 612
Caygan islet 411
Cayos del Bajo 45
Cazador, point 310
Cazcarro rocks 340
Cebu island 401
  Eastern side 402
  South-eastern side 465
    beacon 465
    dangers 465
  Western side . . . 447, 451, 455
Cebu, Port 459
  Anchorage 463
  Directions 463
  North-eastern entrance . . . 460
    beacons 460
    buoys 460
    lights 461
  Obstructions 463
  Pilots 460
  Southern entrance 461
    buoys 461
    dangers 461
    light 461
  Tidal streams 463
  Town 464
    climatic table 34
    communication 465
    deratisation 4
    harbour facilities 465
    radio station 14
    repairs 465
    storm signals 11
    trade 465
Celandat islets 207
Celebes sea, current 9
Cent islet 502
Centinela point ; Bohol . . . 468
Centinela point ; Luzon . . . 500
Central peak ; Palawan . . . 92
Central rock ; Tubbataha reefs . 71
Cerro point 466
Cervantes river 312
Cervera reef 345
Cervera shoal 474
Cetaceo, Mount 505
Challenger reef 246
Chambers knoll 149
Chance rock 178
Charybdis shoal 88
Cheron islet 60
Chico island ; Masbate . . . 348
Chico islet ; Panay 359
Chinaga Timor, Mount . . . 169
Chinaman shoals 66
Chindonan island 57
Chinela islet 354
Chinkang village 261
Chocolate islet 406
  Light 406
Chongos bay 195

Page
Church reef 161
Ciego, Port 105
Cimarron islands 532
Circe :
  Bank 354
  Shoal ; Palawan 98
  Shoals ; Sibuguey bay . . 254
Clare shoal 503
Clarendon bay 104
Clarke creek 185
Claver :
  Point 609
  River 609
  Village 609
Claveria bay 500
Claveria town 500
Cliff point 288
Climate and weather, general remarks 16
Climatic tables 28–37
Clotilde rock 136
Coal harbour 556
  Anchorages 557
  Beacons 556
  Dangers 556
Coal Mine reach 183
  Anchorage 184
  Directions 184
  Tidal streams 184
Coal supplies 15
Coamen islet 471
Coayan bay 258
Coba islet 253
Cobo bay 540
Cobo village 541
Cobrador island 340
Cobung, Mount 229
Cocales point 473
Coco :
  Island 239
  Island, Little 239
  Islets 568
Coconongon, Mount 50
Coconongon point 49
Coconut island 428
Cocoro island 66
Cocos island 537
Codon point 542
Codon village 542
Cog point 610
Cogolong bay 321
Cogon village ; Carabao island . 332
Cogon village ; Carmen, Port . 403
Cogton :
  Bay 476
  Mount 468
  Village 476
Coguit point 384
Colapsin point 287
Colasi :
  Bay 321
  Hill 330
  Point ; Mansiol bay . . . 321
  Point ; San Bernardino strait . 425
  Village 321
Collins patch 172
Coloconto bay 369
Colocoto rocks 46
Colongcolong village . . . 349

Page

- Colorada point ; Barrera, Port . 398
  - Light . 398
- Colorada point ; Busin, Port . 388
- Colosi point . 453
- Columbia reef . 556
- Cominauet point . 43
- Comiran :
  - Channel . 107
  - Danger bank . 106
  - Island . 106
- Comot point . 258
- Companario islet . 304
- Compostela village . 402
- Concas reef . 218
- Concepcion :
  - Bay . 359
  - Port . 327
  - Town ; Busuanga island . 55
  - Village ; Concepcion, Port . 327
  - Village ; Panay . 359
- Conceson point . 620
- Condona island . 612
- Condulingan islet . 244
- Condut island . 63
- Cone :
  - Hill . 250
  - Islet . 112
  - Mountain . 526
  - Rock . 78
- Confites reef, Los . 509
- Confusion hill . 142
- Conical hill . 89
- Conico, Mount ; Nonoc island . 595
- Conico, Mount ; Sibuyan island . 342
- Conigaron village . 91
- Conloy point . 547
- Connor, Mount . 173
- Consolacion village ; Sibonga, Port 598
- Consolacion village ; Sogod bay . 483
- Constancia reef . 494
- Constancia shoal . 88
- Consuelo village . 605
- Consumala point . 343
- Cook, Mount . 157
- Copton :
  - Bay . 455
  - Peninsula . 455
  - Point . 455
- Coral bay . 97
- Corcuera point . 329
  - Light . 329
- Corcuera town . 328
- Cordova village . 460
- Cornelis peak . 179
- Corobong, Mount . 278
- Coron
  - Bay . 59
    - directions . 61
    - islands and dangers . 59
  - Harbour . 52
    - anchorages . 53
    - beacons . 52
    - dangers . 52
    - directions . 53
  - Island . 51
  - Passage . 52
  - Point . 52
  - Reef . 60

Page

- Coron—*contd.*
  - Town . 52
    - radio station . 14
- Coronado bay . 244
- Coronado point . 244
- Corte :
  - Mount . 470
  - Point . 470
  - Village . 470
- Cortejan river . 447
- Cortes town ; Bohol . 473
- Cortes village ; Mindanao . 616
- Corumi, Mount . 96
- Cota village . 311
- Cotabato :
  - Entrance . 271
  - Hill . 272
  - Town . 272
- Cotad island . 84
- Cotivas island . 536
- Coutts bank . 48
- Cowhagan island . 600
- Cowie bay . 182
- Crawford cove . 95
- Creagh reef . 170
  - Beacons . 174
- Crest of Wave shoal . 209
- Cresta de Gallo island . 345
- Cresta de Gallo ridge . 336
- Crook reef . 155
- Cruz islands . 295
- Cruz point . 472
- Cuabo :
  - Bay . 300
  - River . 300
  - Village . 300
- Cuatro islands . 481
- Cube rock . 561
- Cucaracha shoal . 354
- Cucurrayan inlet . 44
- Cudao islet . 400
- Cudtingan, Mount . 477
- Cuernos de Negros peaks . 441
- Cueva point . 387
- Cugun point . 533
- Cujangan island . 227
- Culaba town . 412
- Culajit islet . 412
  - Beacon . 413
- Culangalan, Mount . 393
- Culasi :
  - Bay . 362
  - Hill . 352
  - Peak . 527
  - Point ; Capiz bay . 351
    - light . 351
  - Point ; Cebu . 457
  - Point ; San Miguel bay . 527
  - Village ; Capiz bay . 352
  - Village ; Panay, east coast . 362
  - Village ; Panay, west coast . 334
  - Village ; San Miguel bay . 527
- Culatculat reef . 222
- Culebra islet ; Panay . 359
- Culebra islet ; Verdi Island passage . 310
- Culion island . 56
  - Eastern side . 58
  - Islands and dangers off S.E. side 58

Page
Culion island—*contd.*
  Northern side 56
    off-lying islands and dangers 56
  Western side 57
    off-lying dangers 57
Culion, Port 61
  Approaches 60
    beacon 60
    dangers 60
  Beacons 61
  Light 61
Culion town 61
  Radio station 14
Cunilan island 191
Currents, general remarks 6
Cust reef 172
Cutcut point 391
Cutter point 93
Cuyo:
  Island 67
  Islands 64
    islands and dangers in N. part 65
    islands and dangers in S. part 66
    islands and dangers S.W. of 68
  Town 68
    anchorages 68
    buoys 68
    climatic table 28
    directions 68
    light 68
    piers 68
Cuyo East pass 64
Cuyo West pass 64

Daanbantayan town 447
Dabun islet 582
Dabunan point 68
Daca point 630
Daco island 457
Dacut, Mount 213
Dadaliten island 80
Dado bank 78
Dado rock 78
Daet point 526
Daet river 523
Daet town 526
Daga reef 443
Dagat rocks 541
Dagdagen point 531
Dagosungan river 448
Daha cove 410
Daha village 411
Dahakit point 608
  Light 608
Dahican island 600
Dahikan:
  Bay; Luzon 521
    anchorages 522
    directions 522
  Bay; Mindanao 607
  Island; Siargao island 600
  Islands; Luzon 521
  Islets 608
Daho, Mount 219
Daihagon canal 405, 448
Daijagon canal 405, 448
Daikitin village 378

Page
Daingapic point 219
Daingapik point 219
Daiquitin village 378
Daisy islet 173
Daja cove 410
Daja village 411
Dakio island 481
Dakit:
  Islet 396
  Point 479
  Rock; Capaquian island 594
  Rock; Dinagat island 603
  Shoal 479
Dako island 457
Dako islet 596
Dalagnan river 392
  Light 393
Dalaguete point 467
Dalaguete town 467
Dalahican island 99
Dalanganem islands 85
Dalauan island 231
Dalawan bay 104
Dalawan river 104
Dalaynay islets 547
Dalaynay point 547
Daliao:
  Reefs 292
  River 292
  Village 292
Dalingding river 447
Dalipe point 335
Dalopaon town 385
Dalrymple harbour 220
  Anchorage 220
  Directions 220
  Eastern approach 221
Dalupiri island 423
Dalupiri pass 423
Damita rock 420
Damitan village 276
Dammai island 193
Damocan island 217
Damokan island 217
Dampalan bay 389
Dampigan islet 580
Dampirit river 123
Danahon bank 469
Danahon islet 469
Danajon bank 469
Danajon islet 469
Danao:
  Point 402
  River 445
    light 445
  Town 402
Danaodanauan islet 414
Danaon island 615
Danaon village 615
Danawan island 171
Dancalan point 427
Dandulit point 251
Danglai, Mount 579
Danglay, Mount 579
Danhugan island 438
Danjugan island 438
Dansalan, Mount 244
Dansalan village 269
Dao river 336

Page

- Dao village 336
- Dapa channel 601
  - Islets and dangers 601
- Dapa town 601
- Dapdap:
  - Bay 561
  - Point; Guimaras island 368
  - Point; Luzon 519
  - Rocks 419
  - Village 408
- Dapitan:
  - Bay 246
  - River 246
  - Town 246
- Dapnan river 627
- Daquio island 481
- Daquit:
  - Islet 627
  - Point 479
  - Shoal 479
- Darab islet 56
- Daraga islet 420
- Daraga town 559
- Darahuay islands 416
- Darajuay islands 416
- Daram channel 414
- Daram island 414
- Daranasan island 434
- Darby bank 178
- Darcotan:
  - Bay 77
  - Island 77
  - Point 77
- Darokotan, *see* Darocotan
- Darong village 292
- Darsena island 422
- Darvel bay 151
  - Aspect 152
  - Northern side 153
    - off-lying dangers 154
  - Southern side 157
    - aspect 157
  - Tidal streams 152
- Darvel peninsula 154
- Dasaan island 192
- Dassalan island 228
- Dato rock 277
- Datubato island 191
- Datum point 184
- Datum rock 124
- Dauahon islet 410
- Dauajon islet 410
- Dauin point 441
- Dauin town 441
- Dauis village 473
- Dauisan reef 70
- Davao:
  - Gulf 286
    - eastern side 296
    - western side 287
  - River 292
  - Town 293
    - communication 293
    - harbour facilities 293
    - radio station 14
    - tidal streams 293
- Davis rock 45
- Dawildawil island 222
- Dawson rock 164

Page

- Dayan reef 612
- Dayana point 265
- Dayap:
  - Bay 519
  - Point; Apat bay 519
  - Point; Pola bay 319
- Dayhangan bay 590
- Dayhangan village 590
- De la Vina 451
- Deagan island 396
- Deal point 254
- Deatobato island 190
- Debangan island 80
- Debogso island 63
- Debogso rock 63
- Debutunan point 509
- Deceive creek 186
- Del Monte point 38, 312
- Delgada point 509
- Deli berg 186
- Delian island 51
- Demang islet 56
- Denson reef 558
- Dent haven 145
  - Anchorage 145
  - Directions 145
  - Off-lying dangers 145
  - Tidal streams 146
- Depagal island 50
- Deribongan island 78
- Derickson reef 556
- Deseada point 510
- Desolation point 587
- Destacado island 422
- Detobet point 54
- Dewhurst bay 143
- Diablo islet 398
- Dialao point 499
- Diamante rock 423
- Dianglit islet 53
- Diapitan bay 507
- Dibanca islands 60
- Dibanka islands 60
- Dibatuc island 51
- Dibatuk island 51
- Dibayabay bay 510
- Diboyoyan island 49
- Dibu islet 56
- Dibut bay 510
- Dicabaito channel 58
- Dicabaito island 58
- Dicalubuan islet 60
- Dicapadiac island 49
- Dicapanisan point 510
- Dicapululan island 58
- Dicoyan island 56
- Digollorin:
  - Bay 507
  - Point 507
  - River 507
- Digos:
  - Islet 290
    - anchorages 290
  - Outer reef 290
  - Point 290
  - Reefs 290
  - River 289
  - Village 290
- Dihut rock 611

Page
Dijohan point 507
Dijut rock 611
Dikabaito channel 58
Dikabaito island 58
Dikalubuan islet 60
Dikapanisan point 510
Dikapululan island 58
Dikoyan island 56
Dila point. 196
  Light 196
Diligan island 253
Dimakiat island 49
Dimalansan, Port 506
Dimalanta island 49
Dimancal island 63
Dimanglet island; Coron passage 52
Dimanglet island; Linapacan strait. 62
Dimansig island 63
Dimaquiat island 49
Dimasalang town 400
Dimiao town 475
Dimipac island 49
Dimipak island 49
Dinagat:
  Cove 594
  Island 587
  Point 594
  Sound 599
    eastern side 599
    western side 602
  Town 594
Dinago island 610
Dinahican point 511
Dinahikan point 511
Dinapiki point 507
Dinapiqui point. 507
Dinaran island 50
Dinas river 268
Dinas town 268
Dinatadmo point 507
Dingalan bay 510
Dingle point 185
Dinit island 80
Dinug islet 532
Dio islet 576
Dipalian island 58
Dipolod islets 223
Dipolog river 245
Dipolog town 245
Disacan, Mount. 245
Disakan, Mount 245
Disaster, Cape 101
Discovery bank 45
Disucsip point 510
Disumangit point 507
Dit island. 65
Ditaytayan island 60
Ditaytayen island 60
Ditipac river 49
Ditipak river 49
Ditnot islet 82
Ditolong peak 506
Ditolong point 506
Diuata point 496
Diutai:
  Island; Negros, north coast . 444
  Islet; Bais bay 458
  Point 414, 581
Diutay:
  Island 444
  Islet; Bais bay 458
  Islet; Mindanao 612
  Point 414, 581
Divalacan bay 505
Divalacan, Mount 505
Divatu river 158
Divinubo island. 568
  Light 568
Diviuisa point 507
Diwait point 245
Diyoryan cove 548
Doc Can island 190
Doha shoal 446
Dohinog village 245
Dok Kan island. 189
Dolores:
  Point 596
  River 565
  Town 565
Dome:
  Hill 318
  Peak; Mindanao 283
  Peak; Negros 440
  Peak; Palawan 88
Dominga shoal 48
Don islands 446
Don reef 247
Donauang island 280
Donauang shoals 279
Dondonay island 70
Dongdong island 217
Dongon:
  Bay; Janabatas channel . 581
  Bay; Mindoro 40
  Point 40
  Reef 42
Donjon reef 42
Donsol river 391
  Light 391
Donsol town 390
Doog point 439
Doong island 446
Doong reef 446
Doorly patches 108
Doot islet 612
Doris point 184
Dos Hermanas islands . . . 327
Dos Hermanos islets . . . 502
Dos Hermanos peaks . . . 275
Dos Hermanos rocks . . . 500
Double hill 175
Dougal point 96
Drake bank 183
Drake peak 86
Driftwood point 143
Dry bank 215
Duas point 299
Duero town 476
Dugolaan point 277
Duke bank 185
Dulag town 583
Dulangdulang rocks . . . 202
Dulho point 414
Duljo point 474
Duljugan point. 408
Dulugdug point. 414
Dulunguin point 243

Page
Dumagasa point 237
Dumagok islet 270
Dumaguete :
  Point 441
  River 441
    light 442
  Town 441
    anchorages 442
    storm signals 11
Dumakit point 391
Dumalag island 292
Dumalag point 292
Dumali, Mount 320
Dumali point 320
  Light 320
Dumangas point 362
Dumanhug, *see* Dumanjug
Dumanjug :
  Bay 454
  Point 454
  River 454
  Town 454
Dumankilas bay 262
Dumankilas point 262
Dumanquilas bay 262
  Anchorage 265
  Dangers in approach . . 262
  Directions 265
  Inner part 264
  Outer part 262
  Tidal streams 262
Dumanquilas point 262
Dumaquit point 391
Dumaran :
  Bay 85
  Channel 85
  Island 84
    northern and eastern sides . 84
    southern side 84
  Point 85
  Village 85
Dumunpalit island 46
Dumurug point 401
Dumuy point 292
Dumuy village 292
Dunao islet 360
Dunaun island 60
Dundangan island 206
Dungoan cove 591
Dungun point 410
Dungun river 201
Dupon bay 408
Dupulisan bay 270
Dupulisan point 269
Dutch spit 180
Duyagan point 320
Duyon, Trusan 139

East arm ; Halsey harbour . 57
East channel ; Mitford harbour . 121
East entrance ; Mitford harbour . 120
East hill ; Banguey island . . 113
East point ; Batan island . . 551
East point ; Sibetik island . . 179
East rock ; Negros . . . 442
East Banguey patches . . . 115
East Bolod island . . . 224

Page
East Bucas island . . . 597
East Bukas island . . . 597
East Circe shoal . . . 254
East Guhuan islet . . . 114
East Ikikon island . . . 514
East Makinit island . . . 52
East Malcatop island . . . 56
East Malkatop island . . . 56
East Maquinit island . . . 52
East Nalaut island . . . 55
Egbert shoals 576
Egeria :
  Bluff 123
  Rocks 128
  Shoal 178
Egg island 97
Egg islets 510
Eguet point 222
Elbow point 511
Elcano shoal 354
Elefante islet 378
Elephant island ; Taytay bay . 82
Elephant islet 378
Elet island 54
Elinibinid point 54
Ellis shoal 108
Elonbachid island 430
Elopura town 140
Elton bank 139
Emelina island 94
Emilia bay 64
Emmit point 88
Encampment point 102
Encanto, Cape 509
End hill 152
Engaño, Cape 502
  Light 502
Engaño cove 502
  Anchorage 502
  Beacon 502
  Directions 502
Engañoso, Mount 388
English spit 181
Ennanda islet 56
Enrique Villanueva village . . 479
Enriqueta village 431
Entrance island 521
Entry flat 185
Ermita point 450
Ermita rock 450
Ernestine, Lake 75
Erzherzog reef 176
Escalante bay 444
Escalante village 444
Escarceo point 315
  Light 315
Escarpada island 422
Escarpada point 503
Esconchada point 589
Escucha islet 502
Escucha rock 63
Eseo bank 220
Esfuerzo point 83
España :
  River 343
  Shoal 421
  Town 343
Espina point 103
  Light 104

Page
- Espiritu Santo, Cape 560
- Estacion point 246
- Estagno island 506
- Estampa point 338
- Estancia town 358
  - Light 358
- Esteban village 555
- Estero point 389
- Estrella village 318
- Evans island 143
- Eve reef 481

- Fairway shoal 119
- Falmouth bank 48
- Faltaban island 397
- Farol point 495
- Favorite bank 195
- Fearless shoal 114
- Filantropia point 95
- Filemon bank 80
- Finch rock 561
- Fisher shoal 432
- Fitzgerald banks 430
- Flaca point 629
- Flaka point 629
- Flat hill 137
- Flat island 87
- Flat peak 505
- Flat rock 352
- Flecha, Mount 266
- Flecha point 266
- Flechas point 86
- Floripon point 350
  - Light 350
- Fly rock 128
- Flying Fish rock 135
- Fondeado island 89
- Foot islet 431
- Fort Holland settlement 284
- Fortune island 305
  - Light 305
- Framjee bank 47
- Frances reef 149
- Fremantle shoal 159
- Frenzell point 185
- Friedrich haven 175
  - Anchorage 176
  - Beacons 175
  - Directions 176
  - Tidal streams 177
- Friedrich reef 176
- Fuego point 304
- Fuel oil supplies 15
- Fulin island 564

- Gaang point 415
- Gaas bay 602
- Gaas inlet 602
- Gaba bay 552
- Gabao islet 621
- Gabo:
  - Channel 595
  - Islet 603
  - Mount 603
  - Port 603

Page
- Gabung island 100
- Gading river 104
- Gage island 57
- Gaho point 555
- Gaia, Pulau 160
- Gajo point 555
- Gakang islet 474
- Galera, Port 313
  - Anchorages 314
  - Channels 314
    - danger 314
  - Dangers 313
  - Directions 314
  - Leading beacons 313
  - Light 313
- Galintan, Mount 300
- Gallo Malo channel 205
- Galoc island 55
- Galok island 55
- Galvaney island 385
- Gamai point 412
- Gamau point 516
- Gamay:
  - Bay 562
  - Point 412
  - River 562
  - Village 562
- Gamma reef 345
- Gamot bay 621
- Gamot river 621
- Gandaan river 254
- Gandara river 418
- Gandara town 418
- Gantung, Mount 96
- Gapul creek 265
- Garcia shoal 216
- Garcia Hernandez town 475
- Gardiner island 95
- Gardoqui point 272
- Garza island 44
- Gasacan point 268
- Gasakan point 268
- Gasan town 378
  - Light 378
- Gaspar island 378
- Gatahang islet 163
- Gato island 346
- Gato islet 356
- Gatusan islands 250
- Gaus islet 469
- Gay island 505
- Gedeon shoal 91
- Gelagan, Trusan 187
- Gem reef 144
- Gemok mountain 169
- General island 605
- General Luna village 596
- Genuruan islet 412
- Gerardo point 516
- Giffard islet 167
- Gigakit river 609
- Gigakit village 610
- Gigantangan island 411
- Gigante islands 355
  - Light 355
- Gigaquit river 609
- Gigaquit village 610
- Gigmoto bay 547
- Gigmoto village 548

Page
Gigoso point 573
Gihulngan town 451
  Light 451
Gilbert island 430
Giligaon point 440
Gill point 302
Gimalik point 338
Ginatilan town 457
Gingoog bay 496
Gingoog village 496
Ginitligan cove 548
Gintu island 62
Glan river 283
Glan village 283
Gnat reef 105
Gogo pass 357
Gogo point 357
Goitya shoal 221
Gol-loman island 205
Golo island 308
  Light 309
Golo pass 308
Gondra islet 213
Gonsiang village 460
Gorda:
  Mount 474
  Point; Bohol 474
  Point; Carrascal bay 606
  Point; Cebu 453
  Point; Culion island 58
  Point; Lagonoy bay 553
  Point; Macalajar bay 493
  Point; Masbate 400
  Point; Mayo bay 629
  Point; Ragay gulf 383
  Point; Tablas island 339
    light 339
Goreno island 231
Gorrion islet 389
Gorriti shoal 348
Gorro of Siasi peak 211
Goson reef 62
Gosong dangers 67
Gosong rock; South Cuyo group 67
Gosong rocks; North Cuyo group 65
Gosungan reefs 156
  Beacons 156
Gounan island, Great 230
Gounan island, Little 230
Gran Laja rock 502
Granadas village 584
Grande de Mindanao, Rio 241
Grassy point 182
Gray entrance; Dalrymple harbour 220
Gray reef 156
  Beacon 156
Great Bakkungaan island 135
Great Danger bank 108
Great Gounan island 230
Great Sand bank 239
Great Santa Cruz island 238
Green island; Palawan 86
Green Island bay 86
Green islet; Samar 431
Green point 481
Greep reefs 165
Griffin rocks 228
Griffith point 183

Page
Grove point 526
Guadalupe river 464
Guadalupe village 480
Guanguan estero 630
Guanguan peninsula 629
Gubat, Port 426
  Anchorage 427
  Beacon 426
  Light 426
Gubat town 427
Gubauan river 234
Gubbins rock 136
Gued islet 63
Gueritz rock 124
  Beacon 124
Guhangan island 220
Guhuan islet, East 114
Guhuan islet, North 113
Guibuangan village 454
Guide bank 184
Guihalo bay 550
Guihalo village 550
Guihulngan town 451
  Light 451
Guijalo bay 550
Guijalo village 550
Guilutugan island 348
Guimaras island 337
Guimaras strait 364
  Buoyage 364
  Channels 366
  Dangers 364
  Directions 366
  Islands 364
  North-eastern approach 360
    channels 360
    islands and dangers 360
  Northern and western sides 361
    dangers 361
    light 361
  Prohibited anchorage 366
  Southern and eastern sides 363
  Tidal streams 366
Guinanayan island 552
Guinasian islets 361
Guinauayan island 348
Guinauayan point 330
Guinawayan point 330
Guinayangan town 386
Guindacpan islet 469
Guindakpan islet 469
Guindauahan islet 329
Guinduganan bay 388
Guinduganan point 388
Guindulman bay 476
Guindulman town 476
Guindung point 459
Guinhalinan point 383
Guinlabagan island 348
Guinlabo islet 66
Guinlep island 60
Guinluthagan island 348
Guinobatan river 399
Guinsaanan bay 548
Guintacan island 357
Guintakan island 357
Guintarcan island 415
Guintarkan island 415
Guintiguian islets 580

Page
Guintinua island . . . 524
Guintorihan hill . . . 448
Guintorijan hill . . . 448
Guintungauan island . . . 59
Guitinguitin, Mount . . . 342
Guitong village . . . 208
Guiuan town . . . 574
Guiuanon island . . . 365
Guiuanon point . . . 457
Gujangan island . . . 220
Gulisaan islet . . . 136
Gull reef . . . 97
Gum-gum, Sungei . . . 137
Gumaca town . . . 516
Gumaka town . . . 516
Gumalac island . . . 409
Gumalak island . . . 409
Gumaus bay . . . 523
Gumaus point . . . 523
Gumila reef . . . 222
Gunboat harbour . . . 73
Gunong = Mountain. *See* proper name
Gunong, Mount . . . 303
Gusong dilaut . . . 167
Gusong, Pulau . . . 137
Gusun reef . . . 212
Gusun reef, North . . . 212
Gusungan cay . . . 173
Gutob bay . . . 54
Guyang islet . . . 597

Haaienbieh island . . . 186
Hadyibulac island . . . 49
Hagakhak island . . . 592
Hagakhak island, Little . . . 592
Hagdan point . . . 284
Hagna town . . . 476
  Light . . . 476
Hagnaya:
  Bay . . . 447
  Point . . . 573
  Village . . . 448
Hakupan island . . . 379
Halcon, Mount . . . 38
Halcon rock . . . 228
Haldan point . . . 335
Half Channel patch . . . 111
Halian island . . . 599
Halloran reef . . . 155
  Beacon . . . 155
Halog islands . . . 65
Halsey harbour . . . 57
  Anchorage . . . 57
  Directions . . . 57
Haluluko islet . . . 225
Hambly reef . . . 163
Hamiguitan, Mount . . . 301, 630
Hamilo cove . . . 304
Hamilo point . . . 304
Hamoraon islet . . . 396
Hamorauan point . . . 425
Hamorauan reef . . . 425
Hamuan island . . . 626
Hamuraon bay . . . 384
Hamuraon town . . . 384
Hanabatas, *see* Janabatas

Page
Hand rock, beacon . . . 178
Handayan islet . . . 469
Handig point . . . 573
Hangan point . . . 348
Hanigad island . . . 594
Hanigad village . . . 595
Hapitan point . . . 454
Haponan island . . . 537
Haramelio settlement . . . 624
Harbour shoals . . . 180
Hardy patch . . . 145
Hart reef . . . 82
Harvey reach . . . 185
Hasaan village . . . 493
Hastings point . . . 165
Hatton, Mount . . . 142
Hau islet . . . 469
Haycock islands . . . 621
Heel reef . . . 178
  Beacon . . . 178
Hegad island . . . 218
Hegapit river . . . 608
Heherr point . . . 182
Helm harbour . . . 562
Herald point . . . 185
Hermosa bank . . . 407
Hernani river . . . 571
Hernani village . . . 571
Heron point . . . 90
Herschell, Mount . . . 89
Hervor rock . . . 535
Hewett, Mount . . . 157
Hibatan point . . . 419
Hibatan river . . . 420
Hibitnil island . . . 447
Hibuson:
  Island . . . 588
    light . . . 588
  Island, Little . . . 588
  Village . . . 588
Hidong islets . . . 63
Higdup reef . . . 495
High islet . . . 371
High point . . . 521
Higunum rock . . . 562
Hijo river . . . 295
Hikdop island . . . 615
Hilaban island . . . 564
Hilaitan point . . . 451
Hilantangan island . . . 446
Hilongos town . . . 481
Hilutangan channel . . . 470
Hilutangan islet . . . 470
Himalalud town . . . 456
Himamailan town . . . 436
Himamaylan river . . . 436
Himamaylan town . . . 436
Himatagon town . . . 587
Himba channel . . . 204
Himbangan river . . . 587
Himigaran river . . . 436
Himigaran town . . . 436
Himugaan point . . . 443
Himugaan river . . . 443
  Lights . . . 443
Himuguit river . . . 404
Himukitan island . . . 481
Himuquitan island . . . 481
Hinadkaban bay . . . 607

Page

- Hinalinan village 333
- Hinamok island 577
  - Light 577
- Hinatblan reef 415
- Hinatuan :
  - Island 611
  - Passage 604
    - directions 615
    - pilots 604
    - south-eastern approach . 604
    - south-eastern end . . 607
    - southern side . . . 609
    - tidal streams . . . 615
    - western entrance . . . 614
    - western end . . . 612
  - River 623
  - Rock 611
  - Town 623
- Hinatungan point 585
- Hinatungan village 585
- Hindang town 481
- Hingatungan point 585
- Hingatungan village 585
- Hingoso village 373
- Hintotolo channel 354
- Hintotolo island 354
  - Light 354
- Hinubaan town 439
- Hinunangan bay 586
- Hinunangan town 586
- Hinundayan cove 587
- Hinundayan village 587
- Hinutangan islet 469
- Hipayaan river 628
- Hirapsan island 433
- Hiuinatungan island 563
- Hiwata bay 73
- Holland, Port 230
  - Light 230
- Holmes rock 168
- Holo :
  - Anchorage 219
  - Island 214
  - Town 219
    - light 219
- Homalig island 514
- Homonhon island 584
- Homonhon village 585
- Honda bay 88
- Hondagua harbour 518
  - Light 518
- Hondagua town 518
- Hondo river 240
- Hong Aun reef 121
- Hood hill 173
- Hook bay 511
- Horadaba rocks 544
- Horse island 55
- Howard shoal 154
- Howley islet 87
- Huag island 524
- Huagdon point 477
- Huak channel 425
- Huak island 425
- Huevo shoals 96
- Huidobro reef 278
- Huk Kerweer 187
- Hull rock 145
- Humbit islets 549

Page

- Hunter rock 46
- Huraohurao islet 336
- Hurata bay 73
- Hurata village 73

- Ibahai point 349
- Ibajay point 349
- Ibajay town 349
- Ibobor island 83
- Ibot point 326
- Ibus island 275
- Icadambanauan island . . . 82
- Icauayan point 362
- Igai point 264
- Igan point 337
- Igang :
  - Bay 337
  - Point ; Dalupiri island . . 423
  - Point ; Guimaras island . . 337
- Igasan point 219
- Igat :
  - Bay 265
    - anchorages 265
    - directions 265
  - Island 263
  - Point 263
- Igbon island 360
- Igcauayan reef 70
- Iglesia point 97
- Igsoso bay 39
- Igsoso point 39
- Iguana bank 367
- Iguana island 57
- Ikadambanauan island . . . 82
- Ikauayan point 362
- Ikikon island, East . . . 514
- Ilacaon :
  - Channel 361
  - Islet 361
  - Point 361
  - Reef 361
- Ilakaon, *see* Ilacaon
- Ilang river 505
- Ili point 467
- Ilian, Mount 86
- Iligan :
  - Bay 487
    - western side 487
  - Point 504
  - Reef 487
  - River 492
  - Town 492
    - light 492
- Ilihan, Mount 471
- Ilihan point 482
- Ilijan point 482
- Ilin :
  - Island 42
  - Mount 42
  - Point 48
  - Rock 42
  - Strait 43
    - anchorage 43
    - directions 43
  - Village 42
- Illana bay 267
  - Eastern side 271

Page
Illana bay—*contd.*
  Tidal streams 267
  Western side 267
Illultuk bay 54
Iloc island 77
Ilog:
  Anchorage 312
  Bay 388
  River 437
  Town 437
Ilogao point 325
Iloilo province 332
Iloilo river 338
    lights 339
Iloilo strait 336, 367
  North-eastern entrance 367
    buoyage 367
    dangers 367
    directions 368
    light 367
  Pilotage 336
  Pilots 367
  South-western entrance 336
    buoyage 336
    dangers 336
    light 336
  Tidal streams 336
Iloilo town 338
  Climatic table 33
  Communication 339
  Deratisation 4, 339
  Harbour facilities 339
  Lights 339
  Radio station 14
  Storm signals 339
  Trade 339
Ilok island 77
Imalaguan island 68
Imaruan island 65
Imba village 326
Imorigue bay 77
Imorigue island 79
Inabanga river 471
Inabanga town 471
Inagauan river 92
Inagauan village 92
Inagtapan point 48
Inaquaran shoal 387
Inampulugan island 365
Inamucan bay 486
  Anchorage 487
  Directions 487
Inamucan point 486
  Light 487
Inamukan, *see* Inamucan
Inanacule point 104
Inanoran islet 471
Inapupan island 63
Inaruntang point 127
Inayauan town 437
Indagami islet 67
Indagamy islet 67
Indan point 525
Indan river 525
Indong islet 86
Infanta town 511
  Radio station 14
Ingalan island 324
Inganio village 460

Page
Ingiaran point 95
Iniaoan, Mount 276
Initiao:
  Bay 492
  Point 492
  Village 492
Iniyao islet 570
Inlulucut island 57
Inlulukut island 57
Inopacan town 480
Inopakan town 480
Iogiog bank 364
Ipil:
  Point 342
  River 468
  Village 468
Ipolote bay 96
Irirun bay 41
Irirun rock 41
Iris shoal 576
Isa reef 611
Isabel island 327
Isabela channel 232
  Anchorages 233
  Directions 233
  Light 232
  Tidal streams 233
Isabela settlement 234
Isarog, Mount 529
Isda islet 596
Isio town 437
Island bay 95
Isog river 93
Itai rivier 187
Itbu point 312
Iuisan point 467
Ivantacut islet 582
Ivantakut islet 582
Iwahig:
  River; Princesa, Puerto 91
  River; San Antonio bay 96
  Village 91
    climatic table 29

J. B. Miller bay 505
Jagna bay 475
Jagna town 476
  Light 476
Jaldan point 335
Jambongon island 130
James patch 150
Jamuraon bay 384
Jamuraon town 384
Janabatas channel 581
  Beacons 581
  Buoy 581
  Islands 581
  Light 581
  Pilots 578
Jangan point 348
Janoyoy islet 596
Japitan point 454
Jaro church 368
Jaro point 368
Jasaan village 493
Jau islet 469
Jaulo island 520

Page
Java reef 72
Jessie shoal 109
Jessie Beazley reef 71
Jesus point 521
Jibatan point 419
Jibatan river 420
Jibitnil island 447
Jigdup reef 495
Jilaitan point 451
Jilantangan island 446
Jimalalud town 456
Jimenez town 489
Jimuguit river 404
Jinalinan village 333
Jinamoc island 577
  Light 577
Jinatblan reef 415
Jinhling islands 202
Jintotolo channel 353
  Islands and dangers . . . 353
  Lights 353
Jintotolo island 354
Jinutangan islet 469
Jobo islet 620
Jobo point 619
Johns reef 543
Johnson island 86
Johnston rock 135
Johnstone bluff 124
Jolo:
  Anchorage 219
  Island 214
    southern side . . . 214
    tidal streams . . . 214
    western and northern sides . 217
  Town 219
    climatic table . . . 31
    communication . . . 219
    harbour facilities . . . 219
    light 219
    radio station 14
Jomalig island 514
Jones town 328
Jordan town 338
Jose Panganiban, Port . . . 522
  Beacons 522
  Directions 523
Jose Panganiban town . . . 522
Juac channel 425
Juac island 425
Jumbit islets 549
Junction point 185
Juraojurao islet 336

Kaba point 607
Kabadbaran river 498
Kabadbaran town 498
Kabadea point 555
Kabahan island 342
Kabakuhan point 347
Kabalantian point 288
Kabalarian islet 574
Kabalata, Mount 271
Kabalawan islets 580
Kabalete island 516
Kabalian, *see* Cabalian
Kabalik point 337

Page
Kaban islet 310
Kabankauan island 198
Kabantian point 476
Kabantulan islet 469
Kabarasan point 574
Kabatan river 300
Kabatoan village 561
Kabatuan village 561
Kabaun island 431
Kabay bay 569
Kabay village 570
Kabgan, *see* Cabgan
Kabikungan river 500
Kabilan islets 594
Kabilao island 472
Kabilauan island; Busuanga . 49
Kabilauan island; Coron passage 52
Kabilison island 421
  Light 421
Kabingaan island 213
Kabiyangan point 453
Kablagna point 575
Kabo island 613
Kabo reef 613
Kabodiangan point 342
Kabog, *see* Cabog
Kabuang point 495
Kabuaya village 631
Kabug point 322
Kabugan islands; Leyte . . 586
Kabugao, *see* Cabugao
Kabugao river 543
Kabugon river 520
Kabukan island 218
Kabulan islet 470
Kabulao bay 477
Kabulao point 476
Kabulauan island 64
Kabuli island 77
Kabulig bay 493
Kabun cove 592
Kabuntug village 596
Kaburauan, Mount 384
Kabusao village 529
Kabut island 257
Kadakan river 583
Kaduayan village 220
Kadulan point 396, 400
Kaduruan point 348, 401
Kadyahan shoal 212
Kagamotan bay 562
Kagan point 297
Kaganuhan point 297
Kagayan, *see* Cagayan
Kagayan Sulu group 73
Kagayan Sulu island 73
Kagazancillo village 70
Kagbanlio point 574
Kagbatan island 52
Kagbulauan island 552
Kagdanao, *see* Cagdanao
Kagdullon islands 417
Kagdyanao bay 603
Kagdyanao village 603
Kagliliog point 528
Kagmanaba bay 383
Kagnipa island 429
Kagosoan point 584
Kagraray, *see* Cagraray

Page
- Kagsao point 529
- Kaguait harbour 618
- Kaguait village 618
- Kagurai point 43
- Kagurai village 43
- Kahagnaan town 481
- Kahamkamman islet 115
- Kahoagan island 433
- Kaibiran town 412
- Kaima bay 385
- Kajidiokan town 344
- Kajui reef. 42
- Kakatan island 208
- Kakayaren island 57
- Kakayatan island 63
- Kakbukao islet 84
- Kakeres village 467
- Kakub point 591
- Kalaba islet 371
- Kalabadian island 82
- Kalabago point 341
- Kalabakang river 183
- Kalabugdong island 79
- Kalabukai island 83
- Kaladis point 260
- Kalagkalag bay. 456
- Kalagkalag village 456
- Kalagnaan island 357
- Kalaguan island 414
- Kalaguhan village 297
- Kalagusang point 234
- Kalagwa islands 524
- Kalalaiyojan point 42
- Kalamansig settlement . . . 279
- Kalamian group 48
- Kalampisauan island 54
- Kalampunian, Pulau 121
  - Light 122
- Kalanaga bay 551
- Kalanaga point 551
- Kalandagan island 86
- Kalandorang bay 103
- Kalangaan cay 131
- Kalangaman islet 405
- Kalanhayaun island 47
- Kalankan bay 378
- Kalantas rock, light 425
- Kalapadan bay 549
  - Anchorages 549
  - Dangers 549
  - Directions 549
  - Light 549
- Kalapan, *see* Calapan
- Kalape bay 471
- Kalape town 471
- Kalasag bay 85
- Kalatagan point 306
- Kalaton point 342
- Kalauag, *see* Calauag
- Kalauit village 49
- Kalavera point 593
- Kalavite, Cape 38
  - Light 38
- Kalavite, Mount 38
- Kalaylayan bay ; Linapacan island 62
- Kalaylayan bay ; Luzon . . . 372
- Kalayuan point. 425
- Kalbayog river 418
- Kalbayog town 418
- Kalbiga river 416
- Kalbiga town 415
- Kalianan shoal 575
- Kalibang island. 64
- Kalibo town 349
- Kalibon point 270
- Kalibugon hill 96
- Kaligangan point 483
- Kalikoan island. 572
- Kalikoan pass 572
- Kaliling town 437
- Kalingmomo point 278
- Kalintaan island 425
- Kalipapa village ; Negros . . 439
- Kalipapa village ; Sambulauan, Port 269
- Kalipipit island 58
- Kalis point 51
- Kalitan point 60
- Kalituban islet 469
- Kalituban reef 469
- Kalo islet 56
- Kalolbon town 542
  - Light 542
- Kalomutan, Mount 394
- Kalongkalong point 442
- Kaltagan island. 582
- Kaltom, Port 49
- Kalubian village 411
- Kalubkub point 363
- Kaludlud island 228
- Kalug point 252
- Kaluitan island 231
- Kalumangan point 408
- Kalumbagan island 59
- Kalumbuyan island 56
- Kalumpan peninsula 309
- Kalumpang river 311
- Kalumpihan islet 413
- Kalung Kalungun, Pulau . . . 166
- Kalupag island 206
- Kalusa island 71
- Kalut island 233
- Kalutan :
  - Island 110
  - Islet 411
  - Point ; Balambangan island . 110
  - Point ; Banguey island . . 116
- Kaluya island 326
- Kaluya town 326
- Kalwan river 528
- Kamalaniugan village . . . 501
- Kamalian cove 284
- Kamandag island 421
- Kamanga island 46
- Kamanga point. 282
- Kamasusu island 347
- Kamawi island 217
- Kambagio point 592
- Kambai cove 593
- Kambakamba channel . . . 207
- Kambal reef 47
- Kambalaguio point 478
- Kambalo point 344
- Kambalo town 344
- Kambaloi islet 418
- Kambalot reef 415
- Kambanog shoal 363
- Kambari island 84

Page
Kambasak point 601
Kambasak village 601
Kambatutai bay 417
Kambay cove 593
Kambia point 421
Kambidsos rocks 419
Kambiling islet 599
Kamboan hill 455
Kambulayan point 342
Kambulong point 258
Kamerong river. 312
Kamigin island ; Babuyan islands 503
Kamigin island ; Mindanao . 494
Kaminawit point 41
  Light 42
Kamiris point 577
Kamoropudan islets 576
Kampatok point 406
Kampatok reef 406
Kampopo bay 410
Kampoyo point. 457
Kamtas point 39
Kamungi islet 470
Kamutayan, Tanjong. . . . 74
Kamutyajan point 74
Kanaba point 478
Kanabungan island 100
Kanabungan river 230
Kanadag islet 572
Kanaguayan islet 423
Kanaguayan point 409
Kanahauan islands 418
Kanahauan Dako island . . . 418
Kanalasan cove. 283
Kanamai point 457
Kanamong point 588
Kanapiag point. 340
Kanaron island 64
Kanatonatoan, Mount . . . 398
Kanauai island 581
  Light 581
Kanauayan point 414
Kanauayor islet 494
Kanayut point 593
Kandaraman inlet 101
Kandaraman island 101
Kandiis river 236
Kandolu island 572
Kandos bay 609
Kandungao, Mount 471
Kanen, Mount 486
Kang Tipayan Dakula . . . 204
Kang Tipayan Diki 204
Kangan point 254
Kangbangyo island 600
Kangom islet 580
Kangouak point 343
Kangun islet 600
Kanhandon point 588
  Light 588
Kanhanusa island 591
Kanhatid islets 591
Kanhatid point 592
Kanhinaud point 593
Kanigao channel 481
Kanigao island 481
  Light 481
Kaniguin point 483
Kanihaan island 590

Page
Kanikian point 297
Kanimeran islet 99
Kanimo island 526
  Light 526
Kanipaan village 586
Kanipo island ; Cuyo islands . 67
Kanipo island ; Kulion island . 58
Kanipsan village 318
Kanitauan island 53
Kankabato bay 577
Kankuman island 229
Kanlanuk bay 609
Kanlaon volcano 436
Kanloai point 344
Kanmamot island 418
Kanmanok, Mount 472
Kannomanda point 567
Kanoan, Port 478
  Anchorage 498
  Directions 478
  Lights 478
Kanoan town 478
Kanopao point 475
Kanpintak point 588
Kansadok point 592
Kansaga bay 460
Kansilan point 439
Kansina island 213
Kansuriao point 401
Kantamulig hill. 470
Kantiasai bay 594
Kantiasay bay 594
Kantilan river 605
Kantilan town 605
Kantingas point 343
Kanton island 526
Kaohagan islet 470
Kapakian island 594
Kapalai islet 172
Kapale, Pulau 158
Kapalonga town 520
Kaparan village 253
Kapayas islet 487
Kapayas reef 85
Kapid point 331
Kapilehan point 328
Kapilejan point. 328
Kapisahin islet 230
Kapiz, *see* Capiz
Kapnoyan island 68
Kapor, Tanjong 122
Kaprangasan island 418
  Light 418
Kapual channel. 221
Kapual island 221
Kapul, *see* Capul
Kapulaan bay 370
Kapuluan point. 386
Kapuluan reef 386
Kapunuypugan point. . . . 604
Karaballo mountains 500
Karabang island 385
Karabao island 332
Karabuka point 263
Karaga bay 628
Karaga town 628
Karakapan islets 580
Karamai settlement 87
Karamoan, *see* Caramoan

Page
Karamoran town . . . 542
Karangdato point . . . 216
Karanian channel . . . 431
Karanian village . . . 430
Karauisan point . . . 39
Karbin reef . . . 444
Karidad village . . . 595
Karigara bay . . . 413
Karigara town . . . 413
  Light . . . 413
Karikiki island . . . 421
Karikiki island, Little . . . 421
Karingo island . . . 527
Karkar, *see* Carcar
Karnasa island . . . 356
Karogo island . . . 347
Karraskal, *see* Carrascal
Karungdung village . . . 216
Kasameyon point . . . 389
Kasapao, Mount . . . 310
Kasapsapan bay . . . 507
Kasauman point . . . 629
Kasian island . . . 79
Kasiguran, *see* Casiguran
Kasimon point . . . 451
Kasirahan islet . . . 86
Kasogoron bay . . . 584
Kasolgan pass . . . 552
Kasul bay . . . 485
Kasulian island . . . 597
Kasundalo islet . . . 591
Katabangan river . . . 386
Katabangan village . . . 386
Katadman point . . . 403
Kataingan:
  Port . . . 401
  Tetas de . . . 401
  Town . . . 401
Kataisan point . . . 576
Katakian Chica islet . . . 514
Katakian Grande island . . . 514
Katalaban island . . . 566
Katanaguan islands . . . 539
Katanauan bay . . . 373
Katanauan town . . . 374
  Light . . . 374
Katanduanes, *see* Catanduanes
Katarman, *see* Catarman
Katbalogan, *see* Catbalogan
Katbatan point . . . 398
Kateel, *see* Cateel
Katimogan shoals . . . 70
Katinik point . . . 578
Katiyoman point . . . 408
Katmon, *see* Catmon
Katpatin island . . . 397
Katubeg reef . . . 558
Katubig river . . . 433
Katubig town . . . 433
Katundulan point . . . 390
Kauayan:
  Island; Cuyo group . . . 67
  Islet; Dalanganem islands . . . 86
  Point . . . 580
  Town . . . 437
  Village . . . 467
Kaubyan islets . . . 469
Kauit, *see* Cauit
Kauit bay . . . 242

Page
Kauit strait . . . 407
Kauit village . . . 407
Kauitan point . . . 384
Kauluan channel . . . 235
Kauluan island . . . 235
Kaunbalan point . . . 384
Kaurusan point . . . 384
Kavili island . . . 71
Kawayan:
  Islet . . . 419
  River . . . 318
  Town . . . 432
    light . . . 432
Kawit strait . . . 407
Kawit village . . . 407
Kaxisigan island . . . 102
Kayabangan island . . . 590
Kayangon point . . . 467
Kayasa islets . . . 588
Kaybani island . . . 564
Kaye island . . . 612
Kayitan bay . . . 591
Kechil reef . . . 134
Keenapusan island . . . 73
Keerweer, Huk . . . 187
Kennedy bay . . . 154
Kerweer, Huk . . . 187
Kestrel rock . . . 110
Kestrel shoal . . . 134
Keybalis river . . . 282
Kiamba point . . . 282
Kidamak bay . . . 273
Kidapil point . . . 277
Kiddle reefs . . . 167
Kiko reef . . . 601
Kilbait river . . . 387
Kilbay point . . . 386
Kilbay river . . . 387
Kiminatin island . . . 69
Kiminatin Chico island . . . 69
Kinabalu, Mount . . . 5
Kinabatangan hills . . . 142
Kinabatangan river . . . 142
Kinabukasan point . . . 530
Kinaguitman village . . . 424
Kinalang cove . . . 492
Kinalang point . . . 492
Kinalasag island . . . 534
Kinali point . . . 476
Kinamanuka island . . . 525
Kinapundan bay . . . 574
Kinapusan island; Kagayan Sulu group . . . 73
Kinapusan island; Tawitawi group . . . 207
Kinemi river . . . 277
Kinemi settlement . . . 278
Kinibulan group . . . 65
Kinibulan island . . . 65
Kinulubaltan, Tanjong . . . 130
Kiot village . . . 408
Kipit:
  Bay . . . 244
  Peak . . . 253
  Point . . . 244
  River . . . 244
Kissing hill . . . 167
Kling river . . . 282
Kling village . . . 282

Page
Knobs, The 507
Koamen islet 471
Koayan bay 258
Kobo bay 540
Kobung, Mount 229
Kodon village 542
Kogolong bay 321
Kogon village, Carmen, Port . 403
Kogon village ; Karabao island . 332
Kogton, *see* Cogton
Koguit point 384
Kokales point 473
Koko island 239
Kokonongon point 49
Kokoro island 66
Kolambugan bay 491
Kolapis river 137
Kolasi, *see* Colasi
Kolokonto bay 369
Kolokoto rocks 46
Kolosi point 453
Komagat rock 546
Kominauet point 43
Komiran, *see* Comiran
Komot point 258
Kondona island 612
Kondulingan islet 244
Konsumala point 343
Kopia island 302
Kopia village 302
Kopton, *see* Copton
Korobong, Mount 278
Koron, *see* Coron
Korumi, Mount 96
Kota village 311
Kotabato entrance 271
Kotabato town 271
Kotad island 84
Kotkot :
  Island 591
  Point 402
  River 402
Kowhagan islet 600
Kraan river 281
Kubong island 159
Kudao islet 400
Kudat harbour 123
  Anchorage 124
  Beacons 123
  Buoys 125
  Dangers 123
  Directions 124
  Light 124
  Tidal streams 124
Kudat town 124
  Communication 125
  Jetty 125
  Pier 125
  Radio station 14
Kudtingan, Mount 477
Kugasinan point 519
Kuhangan island 227
Kukuban cay 129
Kukurrayan inlet 44
Kukusan hill 169
Kulaba town 412
Kulajit islet 412
Kulangalan, Mount 393
Kulasejang shoal 490

Page
Kulasi, *see* Culasi
Kulasihan shoal 490
Kulassein island 194
Kulaykulay village 216
Kuli Babang inlet 173
Kulibato point 234
Kulion, *see* Culion
Kulungan bay 288
Kulungan point 288
Kumalarang river 264
Kumassie village 288
Kumpong river 176
Kumpong Kumpong island . . 176
Kunilan island 191
Kutkut point 391
Kwinablangan island . . . 626
Kwinonoan village 629
Kwinutay reef 416

La Paz village 618
La Union village 299
Laa island 202
Labao :
  Inlet 265
  Point 483
  Village 483
Labatan hill 255
Labcan point 552
Labian, Tanjong 146
Labno islet 357
Laboyoan point 252
Labuan rock 112
Labucan point 263
Labuk bay 136
  Directions 137
  Islets and dangers 136
  Islands and dangers in approach 135
  Tidal streams 137
Labuk river 137
Labukan point 263
Lacaron village 287
Lacay Lacay point 500
Lacdian islet 359
Lacutan cove 631
Ladong river 165
Lagalag river 372
Lagan point 395
Lagara cove 323
Lagarian point 318
Lagat island 47
Lagatic river 350
Lagatik river 350
Lagichic point 519
Lagichik point 519
Lagnay islet 412
Lago cove 283
Lagonoy gulf 550
  Head of 553
  Northern side 550
  Southern side 551
Lagonoy river 551
Laguimanoc :
  Point 371
  Port 371
    anchorage 371
    directions 371
  Village 371

Page

- Laguimanok, *see* Laguimanoc . 371
- Laguinit island . 414
- Laguio point . 516
- Lagum point . 632
- Lagundi shoal . 462
- Lahad Datu . 157
  - Anchorage . 156
  - Approaches . 155
    - beacons . 155
    - dangers . 155
  - Communication . 157
  - Directions . 156
  - Harbour facilities . 157
  - Settlement . 157
  - Tidal streams . 157
- Lahangan island . 189
- Lahanosa island . 598
- Lahatlahat:
  - Island; Jolo island . 218
  - Island, South; Tawitawi group 192
  - Islet; Basilan island . 229
- Lahi bay . 603
- Laho island . 56
- Lahuy island . 535
  - Eastern side . 536
- Lais village . 287
- Laja islet . 535
- Lajan point . 285
- Lajanosa island . 598
- Lajo island . 56
- Lakandola village . 611
- Lakga point . 297
- Lakit islet . 228
- Lalabuan river . 275
- Lalabuan village . 275
- Lalabugan bay . 274
- Lalauigan:
  - Bay . 43
  - Island . 571
  - Point; Mindoro . 43
  - Point; Samar . 568
- Lalawigan:
  - Bay . 43
  - Point; Mindoro . 43
  - Point; Samar . 568
- Lalayanga point . 273
- Lalim point . 252
- Lallo town . 501
- Lamagon island . 613
- Lamak bay . 165
- Lamanoc point . 476
- Lamanok point . 476
- Lambajon point . 627
- Lambang Lambang island . 263
- Lambayogan point . 255
- Lambillon point . 618
- Lambusan river . 448
- Lamigan point . 629
- Laminusa anchorage . 212
- Laminusa island . 212
- Lamion point . 196
- Lamit bay . 532
  - Anchorages . 534
  - Directions . 534
  - Islands and dangers . 533
  - Northern entrance . 532
  - Western entrance . 533
- Lamit islands . 532
- Lamitan town . 234

Page

- Lamon:
  - Anchorage . 622
    - beacons . 622
    - buoys . 622
    - dangers . 622
  - Bay . 514
    - western side . 514
  - Point . 622
- Lampaqui islet . 270
- Lampassan island . 117
- Lampinigan:
  - Island; Banga, Port . 251
  - Island; Basilan island . 232
  - Village . 232
- Lampon, Port . 514
- Lamud island . 56
- Lamuyong island . 263
- Lanan river . 399
- Lanang point . 294
- Lanang river . 570
- Lanao:
  - Lake; Mindanao . 492
  - Lake; Pacijan island . 407
  - Village . 408
- Lamboyan point . 245
- Landargun, Mount . 96
- Landassan river . 277
- Lane rocks . 541
- Lang islets . 608
- Langaan islet . 135
- Langao point . 425
- Langaran, Port . 486
- Langaran shoal . 486
- Langas island; Basilan island . 231
- Langas island; Darvel bay . 161
- Langatian village . 245
- Langauin reef . 320
- Langean bay . 85
- Langean point . 85
- Langisan island . 70
- Langkan bay . 85
- Langob village: Cebu . 452
- Langob village; Guintacan island 357
- Langoi island . 84
  - Light . 84
- Langon shoal . 211
- Langoy island . 84
  - Light . 84
- Langsana islet . 123
- Langtad point . 465
- Languyan point . 199
- Languyan, Port . 199
- Languyon point . 452
- Languyon river . 627
- Lanhil island . 239
- Lankayan islet . 134
- Lantao islets . 514
- Lantao rock . 514
- Lanuan point . 359
- Lanuza:
  - Bay . 604
  - River . 604
  - Village . 604
- Laoang:
  - Bay . 433
    - beacons . 433
  - Harbour . 433
  - Island . 434
  - Town . 434

Page
Laonan island 600
Laorente bay 389
Lapac:
  Island 210
  Mount 210
  Point 213
Lapacon river 278
Lapak island 210
Laparan island 190
Lapat point 258
Lapinig bay 562
Lapinig islet 613
Lapinigan:
  Island; Candos bay 609
  Island; Dumanquilas bay 264
  Island; Sibuguey bay 250
  Islands; Tumalung bay 261
Lapinin island 468
Lapinin Chico island 469
Lapiran point 263
Lapitan point 276
Lapulapu reef 59
Lapunlapun islet 74
Laput island 56
Lapuyan river 265
Larapan island 161
Larena town 478
Lasang river 295
Lassak river 278
Lassuan islet 470
Latas islet 264
Lato islet 539
Latoan island 115
Latoan patch, Outer 115
Latuan island 203
Latungon point 486
Lauaan:
  Bay 575
  Islet 575
  Point 575
  Village 575
Lauanan island 63
Lauangan village 433
Lauing bay 539
Lauis ledge 461
  Light 461
Lauit island 49
Laum Tabawan island 207
Laurel rock 136
Lauy point 337
Lavampa islet 392
Lavezares harbour 428
Lavezares town 428
Lavigan anchorage 297
Lawi point 337
Lawigan point 249
Lawler reef 164
Layaban point 488
Layauan bay 589
Layauan bay, Little 589
Laylay river 377
  Light 378
Laylay village 377
Laylaya islets 419
Lazareto islet 580
Lazarino shoal 461
Lazi bay 478
Lazi town 479

Page
Lean island 65
Learmonth reef 164
Lebak:
  Islet 279
  Point 279
  Port 279
  Settlement 279
    radio station 14
Ledan, Mount 73
Ledung, Muara 187
Lefa point 284
Legaspi:
  Port of 558
    anchorage 558
    directions 558
    light 558
  Reef 558
  Town 559
    climatic table 36
    radio station 14
    storm signals 11
Lehnert reef, beacon 179
Leleboon island 572
Lemeri point 449
Lemeri town 309
  Light 309
Lemery point 449
Lemery town 309
  Light 309
Lemondo island 227
Lena shoal 54
Lengkabang bay 123
Lenungan island 617
Leonan cay 132
Leonidas bank 47
Letayen island 259
Lete island 545
Leung point 435
Leyte:
  Bay 411
  Island 408
    eastern side 583
    northern side 411
    southern side 482
    western side 408, 479
  Town 411
Lian point 383
Lian river 305
Liang river 305
Lianga:
  Bay 620
  River 621
  Town 621
Liangliang village 221
Liatui island 49
Libagao island 325
Libagon village 483
Libao hill 455
Libarran island 136
Libas:
  Channel 600
  Cove 351
    lights 351
  Port 567
    anchorages 567
    directions 567
  Village 351
Liberanan head 583
Libertad river 456

Page
Libho bay 589
Libho village 590
Libjo bay 589
Libjo village 590
Libog town 557
Libro point 77
Libtong bay 581
Libucan Gutiay island 419
Libucan islands 419
Libukan Gutiai island 419
Libukan islands 419
Lictin point 547
Liess point 278
Ligas point 105
Ligitan:
  Channel 171
    tidal streams 173
  Group 171
  Islet 171
  Reefs 176
    beacons 176
Liguan point 556
Lihiman island 135
Lijatlijat rocks 207
Likoko islet 593
Liktin point 546
Lila town 475
Lilisan point 298
Liloan:
  Bay 483
    light 483
  Point 457
  River 402
  Town; Cebu 402
  Town; Panaon island 483
Lima point 297
Lima rock 525
Limaa point 52
Limaiag reef 477
Limaiog reef 477
Limasawa island 482
Limbangan point 83
Limbayan islet 273
Limbug cove 268
Limit point 304
Limut point 298
Lin gi san reef 128
Linampanan island 547
Linao:
  Bay 278
  Island 564
  Light 501
  Point; Mindanao 278
  Point; Samal island 293
  River 501
  Village 501
Linaon town 437
Linapacan island 61
  Islands and dangers eastward of 64
Linapacan strait 58
  Islets and dangers 58
Linapakan island 61
Linapakan strait 58
Linawan island 225
Linek village 271
Lingig river 625
Lingig town 625
Lingit town 625
Linguion, Mount 558

Page
Linguisan point 250
Lininob rock 44
Linkabo, Pulau 137
Linoa islet 571
Lintangan village 242
Linugos village 496
Liog point 410
Lipa village 39
Lipadas village 292
Lipari island 254
Lipata:
  Bank 462
  Mount 371
  Point; Cebu, Port 462
  Point; Luzon 375
  Point; Panay 333
  Point; Samar 424
  River 511
  Village 333
Lipayran island 446
Lipusan bay 564
Liscum bank 258
Liscum reef 42
Liskum reef 42
Lisub cove 589
Litalit bay 600
Litao islet 539
Little Bakkungaan island 135
Little Coco island 239
Little Cruz island 295
Little Darahuay island 416
Little Darajuay island 416
Little Dipolod islet 223
Little Gounan island 230
Little Hagakhak island 592
Little Hibuson island 588
Little Karikiki islet 421
Little Koko island 239
Little Layauan bay 589
Little Malanipa island 238
Little Maosonon island 78
Little Molleangan island 116
Little reef 164
Little Santa Cruz island 238
  Light 238
Liuay rock 246
Livas point 433
Llewellyn bank 183
Llorente town 570
Load island 613
Loai river, light 475
Loay river, light 475
Loay town 475
Lobo, Mount 317
Lobo town 317
Loboc cove 488
Loclabuan bay 252
Locoloco point 317
Locot bay 550
Locot islets 550
Locsico bay 255
Loculan:
  Point 490
  River 490
  Shoals 490
  Village 490
Lode bay 422
Loguingut islet 358
Logung point 278

Page

- Lok Bakong hill 173
- Lok Bakong inlet 173
- Lokbuan hill 67
- Lokoloko point 317
- Lokot islets 550
- Loksiko bay 255
- Lokulan, *see* Loculan
- Lolo bay 93
- Lolong point 545
  - Light 546
- Long reach ; Simatahan river . 184
- Longos point 524
- Looc :
  - Bay ; Dinagat 588
  - Bay ; Lubang island . . . 307
  - Bay ; Masbate 347
  - Bay ; Samar 424
  - Bay ; Tablas island . . . 330
    - anchorages 331
    - danger 330
    - directions 331
    - light 330
  - Cove 305
  - Point 424
  - Reef 330
    - light 330
  - River 528
  - Village ; Lubang island . . 307
  - Village ; Tablas island . . 330
- Look, *see* Looc
- Look Sambang bay . . . 234
- Loom river 568
- Loon town 472
- Lopez :
  - Bay 517
  - River 517
  - Town 517
- Loran island 207
- Loreto reef 64
- Loreto village 588
- Los Confites reef 509
- Losapon river 467
- Louisa shoal 113
- Low Hock peak. 97
- Loxdale shoal 109
- Loyola settlement 624
- Luangat point 210
- Luban island 631
- Luban town 631
- Lubang :
  - Island 306
    - islands and dangers north-east of 308
  - Islands 306
  - Town 306
- Lubas point 557
- Lubic island 67
- Lubik island 67
- Lubucan island 200
- Lubukan island 200
- Lubungan village 245
- Lubutglubut island 47
- Lucatan village 629
- Lucbuan hill 67
- Lucena anchorage 370
- Lucena town 370
  - Radio station. 14
- Lucia, Mount 169
- Lucson point 575
- Lucsuhin islands 537
- Luctaban island 564
- Ludguron island 606
- Ludo point 564
- Lugbung island 340
- Lugus island 213
- Lugus shoal 213
- Luk Barábok Barábok . . . 111
  - Anchorage 111
  - Directions 111
- Lukson point 575
- Luksuhin islands 537
- Lumangbayan river 318
- Lumangbayan village. . . . 318
- Lumaton river 601
- Lumayag rock 245
- Lumbian island 216
- Lumbucan channel 108
- Lumbucan Danger bank . . . 107
- Lumbucan island 107
- Lumbukan channel 108
- Lumbukan Danger bank . . . 107
- Lumbukan island 107
- Lumintao river 41
- Lumislis islet 476
- Lun point. 283
- Lunas, Mount 329
- Lung bay 111
- Lungaon village 50
- Lunod rock 419
- Lunqui island 266
- Lupa island 201
- Lupac point 377
- Lupak point 377
- Lupon river 300
- Lupon village 300
- Lusaran point 337
  - Light 337
- Lusok village 379
- Lusong island 56
- Lutangan island 254
- Lutangan point 254
- Lutao reefs 416
- Lutangan islet 446
- Luuk bay 201
- Luuk Saul channel 197
- Luuk Sula inlet 200
- Luyang river 403
- Luyang town 402
- Luyong point 573
- Luyucan, Port 53
- Luyukan, Port 53
- Luzon bank 66
- Luzon island 304
  - Climate and weather . . . 16
  - Eastern side 504
  - Northern side 499
    - light 499
    - tidal streams 501
  - Southern side. . . . 317, 390
  - South-western side . . . 304
- Luzon reef 234
- Luzon village 298

- Maalequequen island 78
- Maamboc island 446

Page
Maambok island 446
Maangit point 196
Maanoc island 612
Maanok island 612
Maasin:
  Point 93
  River 93
  Town 482
    light 482
Mabago village 460
Mabahang islet 351
Mabahók cay 131
Mabai islet 351
Mabajoc point 216
Mabajok point 216
Mabay islet 351
Mabini point 470
Mabini town 476
Mabio point 372
Mabua river 299
Mabul:
  Island 172
  Passage 172
  Reef 172
Maca reef 444
Maca shoal 444
Macabalan point 493
  Light 493
Macabalo river 558
Macachin point 48
Macaina islet 469
Macajalar bay 492
Macalanhag island 548
Macalayo island 566
Macalbang point 452
Macalelon town 373
  Light 373
Macan islets 434
Macangani island 617
Macaonan point 631
Macarilan islets 545
Macarilan point 545
Macarite island 429
Macatol point 330
Macatul point 398
McKinlay reef 164
Maclayao, Mount 375
Macoto point 383
Macrahon town 482
Mactan island 460
Macuao island 79
Macuhil point 392
Maculabo island 523
Maculay island 266
Maculi point 281
Maculmacul point 434
Macutal river 549
Madai, Mount 157
Madai, Sungei 165
Madalag point 245
Madalag Daco river 363
Madalag Dako river 363
Madalonot point 415
Madamba rock 500
Madanlog point 390
Madaum river 296
Madiaop point 253
Madilao point 498
Madre reef 489

Page
Madtuka point 298
Maducang island 86
Madukang island 86
Madumug islet 377
Mæander patch 119
Mæander reef 71
Maestre de Campo island . . 327
Mafsie, Cape 122
Magabao cove 617
Magabook point 421
Magaguilan islet 399
Magaisi islet 359
Magallanes:
  Bank 47
  Port 392
  River: Mindanao . . . 609
  River; Sibuyan . . . 344
  Rock 392
  Town; Sibuyan island . . 343
  Village; Agusan river . . 497
Magalumbi islet 358
Maganting island 164
Magapu point 276
Magasawang rock 515
Magbagun cove 413
Magbagun point 413
Magcalingao islet 471
Magcaragit island 396
Magdalena, Mount 169
Magdalena town 399
Magdug village 298
Magellan bay 460
Magesang island 429
Maggie reef 113
Magingin river 456
Magkalingao islet 471
Magkaragit island 396
Maglagabon point 420
Maglolobo bay 575
Maglumba islet 208
Magnaga bay 301
Magnaga village 301
Magnagua, Mount 567
Magnana point 567
Magpa islet 56
Magpeos island 209
Magpie bank 144
Magradongdong village . . . 390
Magranting island 64
Magsatangi point 527
Magtimua rock 426
Magtung point 472
Maguinling islet 549
Magul river 165
Maguling point 281
Magum settlement 630
Magun settlement 630
Maguran reef 432
Mahaba:
  Island; Hinatuan passage . 611
  Island; Masbate . . . 346
  Island; Mindanao . . . 623
  Island; Samar . . . 415
  Islet; Cuatro islands . . 481
Mahanai islet 469
Mahanay islet 469
Mahangin point 592
Mahangit islets 625
Mahinog town 494

Page
Mahuyag, Mount 408
Maiduun islets 569
Maiga islet 161
Maimbung:
  Bay 215
    anchorages 215
    dangers 215
    directions 215
    off-lying islands and dangers 216
    tidal streams 215
  River 215
  Town 215
Mainaga cove 311
Mainit bay 328
Mainit river 451
Majaba island; Masbate . . 346
Majaba island; Samar . . 415
Majangit islets 625
Majinkil islet 164
Majuyag, Mount 408
Maka reef 444
Maka shoal 444
Makabalan point 493
  Light 493
Makadlao island 429
Makahalar bay 492
Makaida bay 415
Makaina islet 469
Makairiben island 80
Makalbang point 452
Makalelon town 372
  Light 373
Makambol settlement . . . 630
Makangani island 617
Makar village 283
Makarite island 429
Makasser banken 180
Makate island 566
Makatol point 330
Makatul point 399
Makesi island 90
Makilikil point 436
Makinit island, East . . . 52
Makinit islands 52
Maklayao, Mount 375
Makoto point 383
Makrohon town 482
Maktan island 460
Makuao island 79
Makuhil point 392
Makulabo island 523
Makulay island 266
Makumbol settlement . . . 630
Malabahoc, Mount 477
Malabahok, Mount 477
Malabang river 274
Malabang town 275
  Anchorage 275
  Radio station 14
Malabrigo point 317
  Light 317
Malabungut island 535
Malabuyoc point 457
Malabuyoc town 457
Malabuyok point 457
Malabuyok town 457
Malacha islet 351
Malaga river 586
Malagas point 512
Malaguit:
  Bay 524
  River 524
  Village 524
Malagundi point 317
Malahon island 54
Malahibomanok islet . . . 310
Malajibomanoc islet . . . 310
Malajon island 54
Malaka point 200
Malalag bay 288
  Anchorage, directions . . 289
Malalag village 289
Malalan point 285
Malamaui island 231
  Light 233
Malamaui road 231
  Anchorage 232
  Approaches 231
    beacons 231
    dangers 231
  Directions 232
  Tidal streams 233
Malanao anchorage 93
Malanao island 93
Malanat islets 514
Malandoc river 335
Malandok river 335
Malandong, Tanjong . . . 154
Malangaban island 359
Malangai village 264
Malangas village 264
Malanipa island 238
Malanipa island, Little . . 238
Malapantao, Mount . . . 437
Malapascua island 406
  Light 406
Malapingal point 388
Malaposo islets 59
Malarad islets 538
Malaroroi islet 60
Malaroroy islet 60
Malasa point 196
Malasugat bay 249
Malasugat point 249
Malasugue islet 527
Malatandan point 372
Malatpuso rock 82
Malatuna point 280
Malauig Balas point . . . 361
Malaumauan island 392
Malavatuan island 308
Malavinuan cove 284
Malay river 333
Malaylay river 315
Malayo reef 599
Malayoc point 420
Malayok point 420
Malazor point 515
Malbatan island 63
Malbato bay 53
Malbinchilao islands . . . 56
Malbug, Mount 329
Malbug river 391
Malcapuya island 60
Malcatop:
  Island; Calamian group . . 56
  Island; Cuyo group . . . 68
  Island, East 56

Page
Male islet 608
Malibago bay 581
Malibago village 581
Malibak islet 264
Malicut island 191
Maligay bay 266
Maligun island 65
Malikut island 191
Malilipot town 553
Malimpalen islets 59
Malinao inlet 602
Malinao town 553
  Light 553
Malingin islet 365
Malingui islet 469
Malinonok islets 621
Malinsono island 100
Malipano anchorage 293
Malipano islet 293
Malita village 287
  Radio station. 14
Malitbog town 482
  Light 482
Malkapuya island 60
Malkatop island ; Kalamian group 56
Malkatop island ; Cuyo group . 68
Malkatop island, East . . . 56
Mallawallé :
  Channel 127
    beacon 127
    dangers 127
    tidal streams 138
  Eastern dangers 119
  Island 118
Malolo, Mount 511
Malonao rock 77
Maloncon island 504
Malontod point 405
Malotamban island 80
Malpagalen island 49
Malpal point 358
Malpandon islet. 56
Maltatayoc island 55
Maltatayok island 55
Malubug bay 269
Malubug point 269
Malubutglubut island 63
Malugan point 493
Malum river 200
Malusi point 289
Malusu bay 230
Malusu river 230
Mamad island 223
Mamannak island 227
Mamanoc island 222
Mamanok island 222
Mamanuc island 193
Mamanuk island 193
Mambacayao island 446
Mambagi reef 467
Mambagi village 467
Mambagid point 363
Mambahab point 412
Mambahao, *see* Mambajao
Mambahenauhan islet . . . 129
Mambajao :
  Mount 494
  Port 495
Mambajao—*contd.*
  Town 494
    light 495
    radio station 14
Mambakayao island 446
Mambocayan point 453
Mambokayan point 453
Mambulao point 387
Mambulao town 522
Mamburao :
  Bay 39
  Reef 39
  River 39
  Village 39
Mamon island 598
Manadi islet 42
Managao point 404
Manalik channel 197
Manamil islet 285
Manamoc island 65
Manamok island 65
Manampili islet 170
Manamrag point 542
Manamrag, Port 542
Manangal island 227
Manangula point 278
Manaol point ; Bucas Grande I . 609
Manaol point ; Manay bay . . 628
Manapao point 353
Manapla river 363
Manapla town 363
Manay :
  Bay 628
  River 628
  Village 628
Mancahorom island 623
Mancao point 551
Mandag point 548
Mandah island 74
Mandalagan river 364
Mandalala point 60
Mandan island 74
Mandaon village 347
Mandaue tower 461
Mandaui island 308
Mandi rock 223
Mandiralla island 129
Mandit island 65
Mandolan island 197
Manduao point 629
Mandul, Pulau 187
Mandulog river 492
Manga river 529
Mangal point 229
Mangal river 234
Mangarin bay 41
  Anchorage 42
  Beacons, buoys 41
  Directions 42
  Islets and dangers 41
  Light 42
  Tidal streams. 43
  Wharf 42
Mangarin village 41
Mangayao island 371
Mangayao point 587
Mangeao point 448
Mangenguei island 56
Mangenguey island 56

Page

- Mangkao point 448
- Mangkassar banks 180
- Manglet island 56
- Mangli cove 603
- Mango point 380
- Mangrove:
  - Point; Burias 388
  - Point; Dent haven . . . 145
  - Point; Honda bay. . . . 88
  - Point; Tanao pass. . . . 522
- Mangsi:
  - Channel 109
    - directions 110
  - Danger bank 109
  - Great reef 109
  - Islands 109
- Mangsoagui point 44
- Manhud point 561
- Manhuyod point 456
- Manhuyod town 457
- Maniacolat island 208
- Maniakolat island 208
- Manicani island 573
- Manicnic islet 517
- Manigonigo islet 354
  - Light 354
- Maniguin island. 333
  - Light 334
- Manikani island. 573
- Manimoc hill 44
- Manimok hill 44
- Manipulon islet 358
- Manito reef 557
- Maniuayan island 380
- Manjud point 561
- Manjuyod:
  - Point 456
  - River 457
  - Town 457
- Mankahorom island 623
- Manlegad island 63
- Manoc island 348
- Manoc point 411
- Manocmanoc islets 356
- Manog point 307
- Manok island 348
- Manok point 411
- Manokmanok islets 356
- Manolaba island 54
- Manolebeng island 54
- Manowawan islet 623
- Manorigao village 628
- Manote islet 207
- Mansaca point 296
- Mansalai bay 321
- Mansalai village 321
- Mansalay bay 321
  - Anchorage 321
- Mansalay village 321
- Mansiol bay 321
- Mansiol point 321
- Mansoagui point 44
- Mantabuan island 203
- Mantabuan islet 159
- Mantakwin bay 94
- Mantalakan point 284
- Mantalinga islet 352
- Mantalingahan, Mount . . . 96
- Mantalingajan, Mount . . . 96
- Mantalingajan range . . . 97
- Mantangule island 100
- Mantaquin bay 94
- Mantatao islet 471
- Mantibug point 242
- Mantibug river 242
- Mantigui islet 495
- Mantuaca point. 575
- Mantuaka point 575
- Mantulali island 84
- Manubul island 211
- Manubul village 211
- Manuc Manucan islet 72
- Manucan island 70
  - Light 70
- Manuk Manka island 147
- Manuk Manukan islet . . . 72
- Manukan island. 70
  - Light 70
- Manungut island 221
- Manyagui rock 546
- Manyangit point 111
- Maobanen island 80
- Maopia islet 625
- Maosonon island 78
- Maosonon island, Little . . . 78
- Maowa island 624
- Mapaan point 489
- Mapanas bay 561
- Mapanas village 561
- Mapanga:
  - Bay 300
    - anchorage 301
  - Reef 300
  - River 300
- Mapingil point 520
- Mapotao island 485
- Maputi creek 301
- Maputi point 492
- Maqueda bay 415
- Maqueda channel 539
- Maqueriben island 80
- Maquiliguian point 437
- Maquinalo village 432
- Maquinit island, East. . . . 52
- Maquinit islands 52
- Maquiquiling point 436
- Marabout shoal 95
- Maracanao island 65
- Marakanao island 65
- Marakit island 84
- Maralison island 334
- Maranas islet 149
- Marancalan point 351
- Marangai point 587
- Marangay point. 587
- Maraning bay 199
- Marankalan point 351
- Marapilit island. 415
- Maraquit island. 84
- Maravilla island 430
- Marban bank 215
- Marcelino point. 510
- Marchesa bay 133
- Marcos pass 394
- Marek point 260
- Margosatubig settlement . . . 265
- Mari Sim sim river 126

Page

- Maria:
  - Bay 479
  - Islet 356
  - Peak 169
  - Town 479
- Maribohok bay 473
- Maribohok town 472
- Maribojoc bay 473
- Maribojoc town 473
- Maricaban:
  - Island 310
  - Port 311
  - Strait 311
  - Village 311
- Marigabato point 272
- Marigondon village 460
- Marihatag river 619
- Marihatag village 619
- Marikaban, *see* Maricaban
- Mariki point 241
- Marikitdakit islet 576
  - Light 576
- Marili island 56
- Marily island 56
- Marinab bay 394
- Marinas point 102
- Marinduque 376
  - Eastern side 380
  - Northern side 378
  - Western side 376
- Maripipi island 420
- Mariqui point 241
- Mariquitdaquit islet 576
  - Light 576
- Maririgi islet 392
- Marisan reef 417
- Mariveles point 346
- Mark hill 166
- Marlanga:
  - Bay 381
  - Mount 376
  - Point 381
- Marongas island 218
- Marotang, Mount 504
- Marowop river 143
- Martin bluff 221
- Martin hill 101
- Martinez point 105
- Marudu bay 121
  - Anchorage 121
  - Head of 126
    - anchorages 127
  - Inner part 125
  - Outer part 122
    - beacons 122
    - dangers 122
- Marudu river 127
- Marukal point 200
- Masagasai bay 381
- Masak rock 504
- Masamat bay 534
- Masapelid island 610
- Masapelid passage 612
- Masasungiao islet 417
- Masbate:
  - Harbour 399
    - anchorage 399
    - buoys 399
    - directions 399

Page

- Masbate—Harbour—*contd.*
  - light 399
  - Island 345
    - north-eastern side 398
    - western side 345
  - Town 400
    - storm signals 11
- Masdang cove 602
- Masin:
  - Bank 324
  - Island 323
  - Pass 323
  - Point 323
- Masingin islet 469
- Masinloc:
  - Anchorage 247
  - River 247
  - Village 247
- Masinlok, *see* Masinloc
- Masisi village 410
- Masisingi island 571
- Masiub cove 594
- Masiub point 594
- Masnou islet 535
- Mataba village 346
- Matabal river 278
- Matabang river 312
- Matabao island 396
- Matabas island 444
- Matagda islet 359
- Matagdac islet 392
- Mataha island 226
  - Light 226
- Mataha river 374
- Mataja island 226
  - Light 226
- Mataking, Pulau 158
- Mataking Kechil 158
- Matalan point 398
- Mataling river 275
- Matalom town 481
- Matanal, Mount 229
- Matanal point 229
- Matandumaten rock 525
- Matanog peak 253
- Matarabis islet 66
- Matarinao bay 572
- Matarinao point 571
- Matatal, Mount 215
- Matatindoc point 438
- Matatindok point 438
- Mataya island 51
- Mataya reef 51
- Mati town; Pujada bay 631
  - Light 631
  - Radio station 14
- Mati village; Linao bay 279
- Matil point 282
- Matimus:
  - Point 274
  - River 274
  - Village 274
- Matina village 292
- Matingbi cove 593
- Matlang bay 408
- Matlang village 408
- Matnog bay 426
- Matnog town 426
- Matoco point 311

Page

- Matoko point 311
- Matos point 196
- Matos shoal 217
- Matulin rock 544
- Matung point 410
- Matungun hill 121
- Matungun river 126
- Matutum, Mount 283
- Mauban anchorage 515
- Mauban town 515
- Maumaun islet 469
- Mauo river 424
- Maus, Mount 58
- Mawes island 624
- May Williams shoal 115
- Mayanpayan island 53
- Maydolong cove 569
- Maydolong village 569
- Mayo bay 629
- Mayo settlement 629
- Mayobanen island 79
- Mayokok island 63
- Mayon volcano 557
- Mayraira point 500
- Maytiguid island 79
- Mayuboc river 372
- Mayubok river 372
- Mecapiot bay 391
- Medano islet 494
- Medellin town 448
- Medio:
  - Island ; Galera, Port . . . 313
  - Island ; Naranjo islands . . 422
  - Point 389
  - Reef 523
- Mekapiot bay 391
- Mekarah, Bukit 139
- Melau, Pulau 125
- Melau besar hill 121
- Melchor island 378
- Melgar bay 592
- Melgar village 592
- Melobong river 122
- Melville, Cape 105
  - Light 106
- Memnon shoal 73
- Mempakit village 126
- Menor islet 45
- Mercedes port 526
- Meridian reef 149
- Merlin:
  - Point 184
  - Rock 130
  - Trusan 185
- Merope rock 46
- Merotai river 182
- Merrett reefs 164
- Mesecoy bay 81
- Mesekoi bay 81
- Miangas village 303
- Mid-channel bank 210
- Middle channel ; Balabac strait . 109
  - Directions 109
- Middle entrance ; Mitford harbour . 120
- Middle pass ; Danajon bank . 470
- Middle reef ; Rapu Rapu strait . 556
- Middle reef ; Sibulan, Port . . 259
- Middle reef ; Sibutu reefs . . 149
- Middle shoals ; Great Danger bank 108

Page

- Middle Bucas island 597
- Middle Bukas island 597
- Migalog rocks 242
- Migcaniguing point 491
  - Lights 491
- Migkaniguing point 491
  - Lights 491
- Milagros town 348
- Milbuk:
  - Harbour 281
  - River 281
  - Town 281
- Mimul point 210
- Minaaso islet 546
- Minabalay islet 549
- Minaban point 287
- Minabat point 547
- Minadion islet 572
- Minagas point 104
- Minaili cove 544
- Minaloa islet 572
- Minalulan bay 479
- Minalulan point 479
- Minanga point 423
- Minanga village 502
- Minangas bay 50
- Minangas, Mount 50
- Minanut anchorage 570
  - Directions 570
- Minanut island 570
- Minas point 550
- Minas, Port 550
- Minasangan island 569
- Minayit point 513
- Mindanao island:
  - Eastern side 616
    - current 616, 632
  - General remarks 241
  - Northern side 484
  - Southern side . . 247, 257, 277
  - Western side 241
- Mindanao river 1, 271
- Mindanao sea 484
  - Current 484
  - Tidal streams 484
- Mindoro:
  - Island 38
    - climate and weather . . 16
    - eastern side 320
    - north-eastern side . . . 317
    - western side 38
  - Shoal 227
  - Strait 45
    - current 10
    - dangers in south entrance . 47
- Minglanilla town 465
- Minigil islet 544
- Minigil point 544
- Mininlai island 60
- Mininlay island 60
- Minis island ; Jolo approach . 218
- Minis island ; Pilas islands . . 227
- Minna reefs 130
- Minolo point 312
- Mintag point 401
- Minuit 49
  - Anchorage 49
- Miray point 485
- Miraya islet 79

Page

Misamis :
  Port 490
    anchorages 491
    buoys 490
    dangers 490
    directions 491
    lights. 490
    pilots. 491
  Province 493
  Town 490
Misan Misan reef 166
Mitford harbour. 120
  Anchorage 121
  Directions 121
Mitra, Mount 370
Moalboal town 455
Mobo :
  Bay 400
  River 400
  Shoal 400
  Town 400
Mocaboc islet 471
Mocaboc point 444
Moco cove 199
Modum island 121
Mokabok islet 471
Mokabok point 444
Molar rock 535
Molegon river 282
Molleangan island 116
Molleangan island, Little . . 116
Molo town 338
Molocaboc island 444
Molokabok island 444
Molopolo village 587
Mompog island 374
Mompog pass 374
Mona islet. 56
Monad shoal 406
Mondragon town 432
Monk point 184
Monkiaua bay 288
Monmouth shoals 129
Monserat village 298
Monserrat village 597
Montero shoal 345
Montoconan islet 585
Montokonan islet 585
Montufar point 427
Moorhen reefs 165
Morgan point 502
Moro island 232
Moroporo islet 419
Morrell bluff 182
Mosquito rock 130
Mostyn, Mount 157
Motiong point 508
Moysey shoals 180
Moyune shoal 72
Muara Bukat 187
Muara Ledung 187
Mudug river 261
Mudug settlement 260
Muhuy point 337
Mulanai town 374
Mulanay river 375
Mulanay town 374
Muligi islands 74
Muligi patches 129

Page

Mundi rocks 203
Murcielagos :
  Bay 485
    anchorages 485
    beacons 485
    buoys 485
    dangers 485
    directions 485
  Island ; Mindanao, north coast. 485
  Islands ; Mindanao, west coast. 244

Naauan head 492
Nababui island 581
Nababuy island. 581
Nabagbagan point 340
Nabasagan bay 388
Nabasagan village 388
Nabat island 81
Naboled point 311
Nabugtu island 348
Nabugtusan channel . . . 563
Nabugtusan island . . . 562
Nabugtut island 346
Nabulao bay 438
Nabunut island 354
Naburos island 485
Naburul island 337
Naburut islet 359
Nadulao island 364
Naga town ; Cebu 465
Naga town ; Luzon 529
Nagaha bay 571
Naganaka village 261
Nagarao island ; Asid gulf . . 348
Nagarao island ; Guimaras strait. 365
Nagas point 631
Nagiba point 318
Naglaous islet 532
Naglayan island 57
Naglocsaden point 505
Nagnasa island 430
Nagos, Tanjong. 175
Nagsanga islet 419
Nagsilag point 548
Nagtaquin islet 517
Nagtig islet 352
Nagubat island 325
Nagubat islet 611
Nagumbuaya point . . . 543, 550
Naguran island 348
Nahibil point 567
Nailog, Mount 342
Nailon point ; Cebu 404
Nailon point ; Panay. . . . 351
Najibil point 567
Nakavan village 489
Nakiauit point 608
Nalaut island, East 55
Nalaut island, West 55
Nalibas islet 365
Naliwatan, Mount 411
Nalunga island 365
Namalayan, Mount 322
Namatian island 348
Namu point 53
Nang point 371
Nanga island ; Cabulauan islands. 64

Page
Nanga island ; Linapacan island . 63
Nanga islands ; Mindoro strait . 46
Nangalao island . 64
Nangan bay . 297
Nanisetan point . 504
Nanlampalai point . 552
Nanlampalay point . 552
Nanuntugan reef . 562
Napacao point . 476
Napalisan island . 418
Napayauan island . 346
Napla bay . 568
Napolo point . 488
Napula island . 56
Napuscud island . 50
Napuskud island . 50
Naputhao island . 485
Nara point . 279
Naranjo islands . 422
Naranjo pass . 422
  Light . 422
Nariz point . 95
Naro bay . 400
Naro island . 348
Narvaez :
  Bank . 47
  Reef . 462
  Shoal . 490
Nasidman islet . 362
Nasiducang islet . 361
Nasidukang islet . 361
Nasipit harbour . 497
Nasipit village . 496
Naso point . 336
Nasog point . 333
Nasubata :
  Channel . 106
  Island . 106
  Reef . 106
Nasugbu :
  Bay . 305
  Point . 305
  Town . 305
Nasunda islet . 353
Natangdol, Mount . 42
Native point . 94
Nato river . 554
Nato village . 554
Nauai islet . 365
Nauco point . 468, 475
Nauhan, *see* Naujan
Naujan :
  Lake . 318
  Mount . 318
  Port . 318
  Town . 318
Nauko point . 468
Naungan Dakula island . 206
Navahai island . 581
Navahay island . 581
Naval town . 411
Navalas point . 362
Navotas river . 318
Navotas village . 318
Nayon river . 369
Nazaret village . 297
Negra point ; Luzon . 499
Negra point ; Silanga bay . 81

Page
Negros . 436
  Climate and weather . 16
  Communication . 436
  Northern side . 442
  South-eastern side . 440
  South-western side . 438
  Western side . 436
    beacon . 436
    dangers . 436
Nelangcapan, Mount . 483
Nelangkapan, Mount . 483
New Batu Batu settlement . 200
New Orleans point . 502
New Washington settlement . 350
Nichols reef . 164
Nici islet . 56
Niki islet . 56
Nilidlaran pass . 357
Nimamandum, Mount . 504
Nin bay . 347
Ninauan point . 505
Niogan islet . 517
Nipa point . 352
Nipa Nipa island ; Silam harbour . 167
Nipa Nipa islands ; Dumanquilas bay . 264
Niug, Tanjong . 137
Nogas islet . 336
  Light . 336
Nonoc :
  Bay . 390
  Island . 595
  Village . 613
Nonok, *see* Nonoc
Normanby bank . 144
Normanhurst reef . 164
North arm ; Halsey harbour . 57
North bay ; Linapacan island . 61
North cay ; Pamalican group . 55
North channel ; Balabac strait . 106
North channel ; Catbalogan approach . 416
North channel ; Galera, Port . 314
North harbour ; Balambangan I. 111
North hill ; Banguey island . 113
North hill ; Palawan . 76
North islet ; Mallawallé island . 118
North islet ; Tabgon anchorage . 537
North pass ; Verde Island passage 316
North patches ; Great Danger bank . 108
North point ; Dumaran island . 84
North point ; Medio island . 313
North rock ; Tubbataha reefs . 71
North Bais bay, beacons . 458
North Balabac strait . 101
North Balabak strait . 101
North Borneo, State of . 5
  Communications . 6
  Currency . 6
  Government . 5
  Harbours . 5
  Trade . 6
  Weights and measures . 6
North Borneo dangers . 116
North Gigantie island . 355
  Light . 355
North Guhuan islet . 113
North Gusun reef . 212

Page
North Malbinchilao island . . 56
North Mangsi island . . . 109
North Ubian island . . . 193
  Light 194
North Verde island . . . 87
North-east bank; Cagayan Sulu islands 73
North-east bluff; Simaddel island 130
North-east pass; Danajon bank . 470
North-east shoal; Lumbucan island 107
North-west bank; Bohol . . 471
North-west bank; Cagayan Sulu islands 73
North-west bay; Linapacan island 61
North-west channel; Galera, Port 314
North-west islet; Mallawallé island 118
North-west pass; Danajon bank . 470
North-west point; Masbate . 399
North-west point; Ticao . . 397
North-west rock; Calamanian group. 49
North-west rock; Sibuguey bay . 255
North-west shoal; Ramos island . 105
North-west shoals; Great Danger bank 108
North-west Borneo dangers. . 116
Notch hill. 142
Nuang point 500
Nulton point 502
Numancia town. 600
Nunez shoal 405
Nunu islet 469
Nunukan island, Oost . . 186
  Light 186
Nunun point 394
Nunuyan bay 243
Nunuyan point 243
Nunuyon Derat island . . 138
Nunuyon Laut island. . . 138
Nusa islands 207
Nusa Tacbu channel 198
Nusatonga islet 170
Nusia village 604
Nymphe reef 143

Oacan point 560
Obon point 438
Observatory point . . . 112
Obung point 378
Ocata island 536
  Light 536
Ocboc hill. 350
Occidental Negros . . . 436
Ochoa reef 347
Oco island 65
Oco river 545
Ocre point 445
Odiongan:
  Bay; Panay 358
  Bay; Tablas. 330
  River 496
  Village; Mindanao. . . . 496
  Village; Panay . . . 358
  Village; Tablas . . . 330
    light 330
Odok village 593

Page
Ogod river 391
Ohastras islet 355
Ojastras islet 355
Okata island 536
  Light 536
Oko island 65
Oko river 545
Olango channel 470
Olango island 470
Olanivan islet 285
Oltaloro, Mount. 58
Olutanga island. 254
Olutaya island 352
Omadal islet 151, 170
Omapoy island 148
Omapui island 148
Omon point 386
Omon river 386
Omuntol point 546
Onate rock 615
Ontgol point 335
Oom river. 568
Oost Nunukan island . . . 186
  Light 186
Oot point 433
Opol point 490
Opon town. 460
  Light 461
Opong bay 581
Opong island 610
Oras:
  Bay 563
  River 564
  Town 564
Ordoñez bank 401
Orell island 227
Oriental Negros. 436
Origon rock 329
Orista island 515
Ormoc:
  Bay 479
    anchorages 480
  Shoal 405
  Town 479
    light 479
Ormok, *see* Ormoc
Oroquieta river 488
Oroquieta town 488
Oslob point 467
Oslob town 467
Osteng shoal 462
Otabi bay. 394
Oteiza:
  Bay 620
  River 619
  Village 620
Otoe point 385
Oton:
  Bank 337
  Town 336
  Village 79
Outer Latoan patch . . . 115
Outer shoal; Banguey South channel 116
  Beacon 116

Pababat shoal 225
Pabahannan, Tanjong . . . 130

Page

- Pabellon islands 82
- Pabugan point 45
- Pabunuan shoal 229
- Pacahan point 426
- Pacdahauan peak 413
- Pacheco shoal 69
- Pachiri island 56
- Pacijan island 407
- Paculalin river 386
- Padada:
  - Point 298
  - River 289
  - Village 289
- Padang bank 180
- Padang point 425
- Padugan islet 252
- Pagadian:
  - Anchorage 270
  - Bay 269
  - River 271
  - Village 270
- Pagang point 281
- Pagapas bay 309
- Pagassan island 117
- Pagbabacnan point 585
- Pagbabaknan point 585
- Pagbabaugnan point 372
- Pagbasayan islet 600
- Pagbilao bay 370
  - Anchorage 371
  - Directions 371
- Pagbilao Chica island 370
- Pagbilao Grande island . . . 370
- Pagbocavan island 533
- Pagbui rocks 609
- Pagbulungan point 347
- Pagbuy rocks 609
- Paghuriran point 554
- Pagi point 45
- Pagjuriran point 554
- Pagoda cliff 97
- Pagsanhan point 382
- Pagsanhan river 382
- Pahumaan island 204
- Paitan bay 130
- Paitan, Sungei 133
- Pajo river 543
- Pakahan point 426
- Pakalangan village 174
- Pakdahauan peak 413
- Pakia island 213
- Pakiputan strait 294
  - Anchorage 294
  - Dangers 294
  - Directions 294
  - Tidal streams 294
- Paknam shoal 133
- Pala point 374
- Palad reef 382
- Palag bay 550
- Palag point 550
- Palahan islet 560
- Palahangan island 227
- Palajangan island 227
- Palak harbour, *see* Polloc harbour
- Palak town 273
- Palalagoya point 490
- Palan point 567

Page

- Palanan:
  - Bay 506
  - Point 506
  - River 506
  - Town 506
- Palanas point 418
- Palandok point 245
- Palanit river 420
- Palapag:
  - Channel 433
  - Port 434
    - anchorages 435
    - directions 435
    - light 434
  - River 352
- Palapaga Mesa mountain . . 435
- Palapai river 411
- Palapay river 411
- Palasan island 514
- Palaui island 502
- Palawan:
  - Climate and weather . . . 16
  - Eastern side 76
    - tidal streams 76
  - General remarks 76
  - Islands and dangers N.E. of . 61
  - Islands and dangers off southern end 99
- Palaypay point 321
- Pali island 83
- Palid point 245
- Palijon island 433
- Palilan river 489
- Palimban point 280
- Palinahuan point 393
- Palita island 521
- Palliagan island 218
- Palmas island 302
- Palo:
  - Reef 576
  - River 575
  - Town 575
- Palompon:
  - Islands 539
  - Port 409
    - anchorage 409
    - directions 409
    - light 409
  - Town 409
- Paluan:
  - Bay 38
    - anchorages 38
    - approach 38
    - danger 38
  - River 39
  - Town 39
- Palumbanes islands 541
- Palumbato island 523
- Palundangan island 164
- Paly island 83
- Pamaaun reef 444
- Pamai bay 601
- Pamai point 601
- Pamalican island; Cuyo group . 65
- Pamalican islands; Calamian group 55
- Pamalikan islands; Kalamian group 55

Page

- Pamancolan islet 365
- Pamandian river 256
- Pamankolan islet 365
- Pamasaun islet 468
- Pamatadau river 123
- Pamatusin cove 39
- Pamay bay 601
- Pamay point 601
- Pambuan point 527
- Pambuhan:
  - Harbour 571
  - River 433
  - Town 433
- Pambuhan Sur village . . 572
- Pamelikan island 74
- Pamelukan bank 232
- Pamilacan island 474
- Pamilakan island 474
- Paminuitan hill 473
- Pamitinan island 67
- Pamoboan point 404
- Pamosaingan village . . . 609
- Pampang point 390
- Pampang village 471
- Pampanga river 1
- Pamplona river 501
- Pamplona village 501
- Pamuntangan point . . . 376
- Pamutusin cove 39
- Pan pass 359
- Pan de Azucar island . . . 359
- Panabulan islet 252
- Panabutan:
  - Bay 242
  - Point 242
  - River 242
- Panacan:
  - Point 94
  - River 94
  - Village 94
- Panadlihan point 571
- Panag bay 613
- Panagan river 261
- Panagan village 551
- Panagatan cays 48
- Panagatan Malaki islet . . 48
- Panagtaran point 90
- Panakan, *see* Panacan
- Panal reef 444
- Panaldan river 268
- Panalian point 480
- Panalisan point 272
- Panalsagon point 444
- Panalsagon village . . . 443
- Panalsalon reef 445
- Panam point 615
- Panamauan bay 588
- Panamauan point 588
- Panampalan point 511
- Panampanang island . . . 203
- Pananag village 282
- Pananamitan point . . . 573
- Pananapan point 504
- Panangatan point 511
- Panangiran peak 322
- Panaon island 483
  - Light 483
- Panaon strait 483

Page

- Panay:
  - Bank 47
  - Island 332
    - eastern side . . . 357
    - northern side . . . 349
    - tidal streams . . . 353
    - western side . . . 332
  - Island; Catanduanes island . 545
  - River 351
- Pandak island 231
- Pandalusan islet 255
- Pandaman point 544
- Pandami island 210
- Pandan:
  - Bay; Catanduanes island . 540
    - anchorage 540
    - directions 540
    - light 540
  - Bay; Mindoro, east coast . 322
  - Bay; Mindoro, west coast . 40
  - Bay; Panay 333
  - Bay; Sanga Sanga island . 196
  - Islands 40
  - Islet 68
  - Mount 397
  - Point; Catanduanes island . 540
  - Point; Leyte . . . 586
  - Point; Negros . . . 364
  - Point; Soguicay bay . . 322
  - Reef; Sibulan, Port . . 260
  - Reef; Soguicay bay . . 322
  - Town; Catanduanes island . 540
  - Town; Panay . . . 333
  - Village; Sibulan, Port . 260
  - Village; Ticao . . . 397
- Pandanan:
  - Island; Coral bay . . . 99
  - Island; Sulu archipelago 205
  - Point 443
- Pandanon islet 469
- Pandanpandan village . . 216
- Pandaras, Tanjong . . . 135
- Pandarochan bay 44
- Pandarochan village . . . 41
- Pandasan island 302
- Panducan island 194
- Panducan point 226
- Pandukan island 193
- Pandukan point 226
- Pandurucan village . . . 41
- Panga islet 471
- Panga Sinan province . . 2
- Pangalan islet 358
- Pangaldauan island . . . 58
- Pangana Paturuan island . 213
- Panganaa islet 219
- Panganan islet 470
- Pangangan island 472
- Panganiran bay 390
- Pangao point 519
- Pangap islet 471
- Pangasahan:
  - Channel 230
  - Hill 230
  - Island 230
  - River 230
- Pangasinan island . . . 218
- Pangasinan point 301
- Pangatatan island . . . 68

Page
Pangauaran river 49
Pangaypuyan island 248
Pangbaganan river 480
Pangeran Anam village . . 187
Pangian point 242
Pangisian island 80
Pangka'an bay 123
Pangkang point. 83
Panglao :
  Bay 474
  Island 473
  Town 474
Panglima reef 89
Panglimasan river 627
Panguan islet 150
Panguian point 460
Panguil bay 490
Panguil Bato point 285
Panguilinan shoals 490
Pangutarang :
  Group 194
  Island 194
    islands and dangers N.E. of . 194
  Passage. 193
    light 193
  Reef 195
Panigayan settlement. . . . 231
Paniginhan river 549
Panihugan point 197
Paniki point 400
Panikian inlet 592
Panikian island 267
Paniman village 538
Paninihian point 567
Paninilan river 616
Paniqui islands 532
Paniqui point 400
Paniquian island ; Mindanao 267
Paniquian island ; Mindoro . 313
Panirongan island 621
Panirongan village 621
Panirugan point 577
Panisaan point 616
Panitagan island 446
Panlatuan :
  Point 391
  Port 391
  Town 391
Panolean islets 207
Pansipit river 309
Pantalan islet 421
Pantao bay 384
Pantao, Mount 384
Panto Panto point 169
Pantocomi point 38
Pantocunan island 218
Pantokomi point 38
Pantokunan island 218
Panubigan islands 249
Panubulon island 365
Paojican point 45
Paojikan point 45
Papahag island 195
Papat, Tanjong 138
Papayan bay 488
Papucha point 555
Paquia island 213
Paquita islet 525

Page
Paracale :
  Bay 524
  Reef 524
  Town 524
    light 524
Parakale, *see* Paracale
Parang :
  Anchorage 273
  Island 214
  Town 214
  Village 273
Parangan :
  Bay 201
  Island ; Siasi island . . 213
  Island ; Tawitawi bay . . 200
  Islet 208
Parasan harbour 415
Parasan island 415
Parol island 222
Parol village 222
Pasacao :
  Anchorage 385
  Point 385
  Town 385
Pasakao, *see* Pasacao
Pasalat reef 160
Pasaleng bay 500
Pasaleng village. 500
Pasco channel 87
Pasco point 88
Pascoe channel 87
Pasegan Guimba island . . 206
Pasegan Samal island. . . 206
Pasig :
  Islet 565
  River 1
  Rock 517
  Shoal 88
  Shoal, West 88
Pasigpasilan island . . . 227
Pasihan island 407
Pasil :
  Bay 399
  Point 456
  Shoal 490
  Village 357
Pass islet 56
Passage reef 128
  Beacon 128
Passages 15
Pata :
  Island 216
  Point 500
    light 500
  River 500
Patabunan reef 414
Patainga island 213
Patan point 255
Patanunam island 117
Patapat mountains 500
Patawan islet 100
Patayan island 370
Patian island 215
Patnanongan island . . . 514
Patong point 200
Patongong islet 99
Patotol bay 220
Patoyo island 62
Patterson reef 64

Page
Patuco, Port 286
Patunga island 67
Patunungan bay 504
Paturuan island. 213
Pauican point 307
Pauikan point 307
Paulino point 449
Pavitt point 139
Pawican islet 533
Paya island 67
Payao village 256
Payne rock 150
Paypay point 627
Paypayan bay 488
Paz islet 105
Pearl bank 189
  Light 189
Pearl rock. 347
Pearson rock 116
Pechili reef 543
Pedada bay 362
Pedro point 516
Peel, Mount 89
Pegasus reef 143
Peidu Pulangui village . . . 271
Pelada rock 586
Pelanduk rock 187
Pelotes point 589
Pelotes rocks 589
Peña Plata town 418
Peñaplata village 293
Peñascales point 603
Peninsula point. 602
Penuntignan point 427
  Light 427
Pepitas rocks 362
Perak, Pulau 127
Perawan, Tanjong 122
Perez village 517
  Light 517
Peris bay. 383
Peris river 383
Perla reef 446
Perseus reef 345
Pescador islet 455
  Light 455
Petley point 220
Petrel rock 117
Pez rock 342
Philippine islands 1
  Buoyage 3
  Communications 3
  Currency 3
  Deratisation 4
  Earthquakes 2
  General remarks 1
  Government 2
  Harbour regulations . . . 4
  Physical features 1
  Population 2
  Ports of Entry 3
  Ports open to foreign shipping . 3
  Products 2
  Signals 11
  Trade 2
Piacan bay 242
Piacan point 242
Piapi, Mount 288
Piapi reef 288

Page
Picadero point 557
Piedra Blanca ; Coron bay . . 60
Piedra Blanca ; Sulu sea . . 69
Piedras point 389
Pig point 377
Pilar :
  Bay ; Panay 352
  Bay ; Putiao, Port. . . . 391
  Bay ; San Miguel, Port . . 397
  Islet 421
  Point 595
  Port 595
  River 596
  Rocks 411
  Town ; Panay 353
  Town ; Ponson island . . 407
  Town ; Putiao, Port . . 391
  Village 596
Pilas channel 226
  Dangers 226
  Islands 226
  Light 226
Pilas islands 226
  Islands and dangers W. and N.
    of 227
    anchorages 227
  Outlying dangers S.W. of . 228
Pili bay 553
Pillar rock 305
Pilot bank 183
Pilot mount 350
Pin rock 540
Pina islet 242
Pinabuntan point 449
Pinagagan river. 511
Pinagbacajan point 316
Pinagbakahan point 316
Pinagsakayan point 519
Pinahon islet 485
Pinamalayan :
  River 320
  Village ; Iloc island . . . 78
  Village ; Mindoro . . . 320
    light 320
Pinamihagon point 352
Pinamijagon point 352
Pinamucan point 311
Pinamukan point 311
Pinamungahan town 453
Pinamungajan town 453
Pinamuntangan bay 376
Pinamuntangan point . . . 376
Pinandungan point 521
Pinas island 53
Pinatayan shoal 275
Pinavisagan bay 513
Pindilin point 566
Pineda point 340
Pineda reef 345
Pinnacle rock 54
Pinohagan islet 549
Pinol point 281
Pirara point 352
Pirata head 84
Pirate island 97
Pirate point 125
Pisan island 268
Pisan point 268

Piso: Page
  Point 300
  Reef 300
  River 300
Pitas village 123
Pitogo:
  Bay; Caramoan peninsula 538
  Bay; Jolo island 217
  Island 538
  Town 372
    light 373
Piyaui point 85
Placer town; Masbate 348
Placer town; Mindanao 610
Plaridel town 486
Po Estero 222
Pobre island 348
Pocanil:
  Bay 321
  Islet 321
  Point 321
  Rock 322
Pöck, Mount 175
Pöck range 175
Pocket bay 536
Pogot point 328
Pohun point 293
Pokanil, *see* Pocanil
Pola:
  Bay 319
    anchorages 319
  Point 280
  River 319
  Town 319
Polalan bay 548
Polarican village 81
Polarikan village 81
Poliki bay 557
Poliki reef 557
Poliqui bay 557
Poliqui reef 557
Polillo:
  Harbour 512
    anchorage 513
    buoys 512
    dangers 512
    directions 513
    lights 512
  Island 511
    northern and eastern sides 513
    western side 511
  Point 512
  Reef 512
  Strait 510
  Town 512
Polloc:
  Anchorage 273
  Harbour 273
    anchorages 273
    dangers 273
    tidal streams 274
    tides 274
  Island 273
  Town 273
Polo:
  Bay 487
  Point 487
    light 487
  River 459
  Town 459

Page
Pom pom, Pulau 158
Pomelikan island 73
Pondanan island 547
Ponduhan point 396
Poneas island 600
Pongca bay 257
Pongka bay 257
Ponson island 407
Ponte rock 347
Pontevedra shoal 364
Pontod island 497
Pontud banks 349
Poo point 403
Poo village 470
Poom point 471
Poon point 471
Popototan island 56
Poricos reef 489
Poro:
  Island; Buad channel 415
  Island; Camotes islands 407
  Island; Catanduanes island 547
  Islet; Biliran strait 412
  Islet; Canahauan island 419
  Shoal 407
  Village 407
Porongporong island 541
Port, *see* proper name
Potol point 332
Pou rock 572
Powell rock 126
Power spit 167
Prescott point 182
President shoal 238
Primo reef 78
Princesa point 91
Princesa, Puerto 90
  Anchorage 91
  Buoys 91
  Climatic table 29
  Dangers 91
  Directions 91
  Light 90
  Radio station 14
  Town 91
Prueba:
  Point 510
  Reef 343
  Rock 510
Pryer, Fort 140
Puac point 500
Puan, Pulau 159
Pucio point 333
Pudsey Dawson dangers 128
Pudsey reefs 164
Puerco islet 87
Puerto point 502
Puerto Galera town, light 315
Puerto Princesa town 91
Puerto Princesa village 591
Puerto Real village 515
Pugatin, Mount 476
Pujada bay 629
Pajada island 630
Puju reef 227
Puktol point 520
Pula river 319
Pulaluaac point 217
Pulaluaak point 217

Page
Pulandaga bay 524
Pulandaga point 524
Pulanduta point 347, 354
Pulanglupa point 485
Pulau = Island. *See* proper name
Puli Puli islet 264
Puling island 537
Puling islet 533
Pulingbato hill 410
Pulo river 515
Pulo village 515
Pulog, Mount 1
Puluan, Port 246
Pulupandan town 364
Pulupari island 519
Punahuan islet 391
Punas point 317
Pundaguitan anchorage 297
Pungtud islet 474
Punpungan village 480
Puntog islands 93
Punubulu islet 576
Pura-pura, Pulau 136
Purdie patches 149
Puro islets 397
Purog bay 544
Pusan point 627
Pusgo:
  Point 383
  Port 383
  Reef 383
Putiao, Port 391
Putic island 67
Putic point 215
Putik island 67
Putik point 215
Putili islet 264
Puting Bubangin shoal 373
Puting Buhangin shoal 373
Putri, Mount 170
  Light 178
Puyo:
  Island 588
  Islet 593
  Rock 610
Puyu island 606
Pyramid hill 162

Queen of the Sea bank 69
Quelun point 528
Quezon canal 519
Quezon village 518
Quico reef 601
Quidamak bay 274
Quidapil point 277
Quimbaludan islet 83
Quiminatin island 69
Quiminatin Chico island 69
Quinablangan island 626
Quinabucasan point 530
Quinaguitman village 424
Quinalang cove 492
Quinalang point 492
Quinalasag island 534
Quinalasag passage 535
Quinali point 476

Page
Quinamanuca island 525
Quinapagyan island 527
Quinapundan bay 574
Quiniluban group 65
Quiniluban island 65
Quinonoan village 629
Quinutay reef 416
Quiot village 408
Quipit:
  Bay 244
  Peak 253
  Point 244
  River 244
Quoin hill; Labuk bay 137
Quoin hill; Sibuko bay 170

Rabin point 410
Rabo rock 591
Radio stations 14
Ragay:
  Bay 386
  Gulf 381
    eastern side 383
    head of 386
    tidal streams 382
    western side 382
  River 386
  Town 386
Ragged hill 142
Raha point 111
Raha reef 111
Ramesamay island 90
Ramilette rock 606
Ramon shoal 69
Ramos sland 101
Ranger reef 329
Rapu Rapu:
  Island 551
  Mount 551
  Strait 555
    beacons 555
    buoy 555
    dangers 555
    directions 556
    tidal streams 556
  Town 554
Rassa:
  Island; Naranjo 422
  Island; Palawan islands 94
  Islet 613
  light 613
  Point 426
Rashleigh reef 164
Raso islet 576
Rat island 56
Ray bank 109
Red cliff 90
Red hills 607
Redondo islet 580
Redondo, Mount 587
Reef islet 87
Reef point 145
Refugio:
  Island; Ragay gulf 385
  Island; Tañon strait 450
    light 450

- **Refugio**—*contd.* Page
  - Pass 450
    - anchorage 450
    - buoys 450
    - dangers 450
    - lights 450
- Reinard island 87
- Relief point 95
- Remedios village 567
- Remus rock 412
- Rendezvous point 184
- René shoal 144
- Repairs 15
- Resa bay 278
- Research channel 57
- Reynoso reef 345
- Rhodes island 58
- Richards reef 159
- Ridapon river 491
- Riddells reef 150
- Ridge point 126
- Rifleman rock 112
- Rinabasan cove 509
- Rio Grande de Mindanao 241
- Rios rock 268
- River islet 91
- Rizal:
  - Village; Siargao island 599
  - Village; Sibanoc island 593
  - Village; Ticao 395
- Roach reefs 178
- Roda reef 345
- Roja point 52
- Roldan reef 345
- Roldan rock 248
- Roma point 517
  - Light 518
- Romblon:
  - Island 340
    - eastern side 341
  - Pass 339
    - lights 339
  - Port 340
    - anchorages 341
    - approaches 340
    - directions 341
    - lights 340
    - storm signals 11
  - Province 341
  - Town 341
- Romero reef 345
- Romulus reef 347
- Rona islet 502
- Ronda village 455
- Rosa islet 550
- Rosario:
  - Point 317
  - River 317
  - Rock 365
- Rosas point 340
- Roses reef 525
- Roughton islet 106
- Roughton reef 106
- Round islet; Cuyo islands 67
- Round islet; Libarran island 136
- Royalist reef 82
- Royalist rock 143
- Rubi shoal 423
- Rungus point 536
- Rungus rock 550

NOTE.—All names prefixed by Saint, San, Santa and Santo will be found indexed in alphabetical order after the letter s.

- S. Agustin: Page
  - Cape 296
    - current 297
    - light 296
  - Reef 296
  - Village 41
- S. Ana bay 337
- S. Ana settlement 292
  - Anchorage 293
- S. Andres:
  - Island; Naranjo islands 422
  - Islands; Marinduque 376
  - Mount 382
  - Point 376
- S. Angel bay 519
- S. Antonio:
  - Bay 96
  - Point 395
  - Town 391
- S. Benito village 600
- S. Bernardino islands 427
  - Light 427
- S. Bernardino strait 421
  - Directions 424
  - Northern side 425
  - Southern side 428
  - Tidal streams 421
- S. Bernardo village 482
- S. Carlos point 450
  - Light 450
- S. Carlos town 450
- S. Clara village 311
  - Light 312
- S. Cosme point 395
- S. Cruz:
  - Bank 238
  - Bay 619
  - Harbour 379
    - anchorages 379
    - directions 379
    - light 379
  - Islands; Marinduque 379
  - Islands; Basilan strait 238
    - light 238
  - Point; Davao gulf 291
  - Point; Marinduque 379
  - Point; Taytay bay 81
  - River 379
  - Town 379
  - Village; Davao gulf 291
  - Village; Dinagat 589
  - Village; Mindanao 629
- S. Diego point 305
- S. Dionisio village 359
- S. Fe:
  - Town; Bantayan island 447
  - Village; Mindanao 628
  - Village; Tablas island 331
- S. Fernando:
  - Town; Cebu 465
  - Town; Siargao island 601
  - Town; Sibuyan island 343
  - Town; Ticao 395
  - Village; Panay 362
- S. Filomena shoals 69
- S. Francisco town 407
- S. Ignacio village 629

Page

- S. Ildefonso, Cape . 508
- S. Ildefonso peninsula . 508
- S. Isidro:
  - Bay . 410
  - Town . 410
  - Village . 595
- S. Jacinto, Port . 395
  - Light . 395
- S. Jacinto town . 395
- S. Joaquin river . 575
- S. José:
  - Point; Bayagnan island . 612
  - Point; San Jacinto, Port . 395
    - light . 395
  - Settlement; Bayagnan island . 612
  - Settlement; Bislig river . 624
  - Town; Lagonoy gulf . 551
  - Town; Mindoro . 41
    - radio station . 14
- S. Jose de Buenavista town . 335
- S. Juan:
  - Island . 430
  - Point . 362
  - Town; Siquijor island . 478
  - Town; Tayabas bay . 369
  - Village; Mindanao . 623
- S. Juanico strait . 579
  - Approaches . 579
  - Beacons . 579
  - Buoyage . 579
  - Dangers . 579
- S. Julian town . 567
- S. Luis:
  - Bay . 423
  - Village; Capul island . 423
  - Village; Mindanao . 627
- S. Margarita town . 417
- S. Maria, Mount . 243
- S. Maria, Port . 243
- S. Mateo town . 239
- S. Michael islands . 72
- S. Miguel:
  - Bay . 527
    - anchorages . 530
    - dangers . 527
    - head of . 529
  - Island; Lagonoy gulf . 552
  - Island; San Miguel bay . 528
  - Island; Ticao . 394
    - light . 394
  - Islands; Sulu sea . 72
  - Point; East Bucas island . 597
  - Point; Samar . 570
  - Point; San Miguel island . 552
  - Port . 397
  - Village; East Bucas island . 597
  - Village; Limasawa island . 482
  - Village; Linapacan island . 62
  - Village; Pambuhan harbour . 571
  - Village; Samar . 418
- S. Monica islet . 56
- S. Monica point . 467
- S. Narciso town . 383
- S. Nicolas, Mount . 362
- S. Nicolas settlement . 61
- S. Niño:
  - Harbour . 421
  - Island . 421
  - River . 620

Page

- S. Niño—*contd.*
  - Town . 421
  - Village; Mindanao . 620
  - Village; Negros . 364
- S. Pascual town . 388
- S. Pedrino point . 309
- S. Pedro:
  - Bay . 575
    - beacons . 575
    - buoyage . 576
    - islets and dangers . 576
    - lights . 576
  - Fort; Cebu . 461
    - light . 461
  - Fort; Iloilo . 338
  - Point . 340
- S. Pinetan point . 389
- S. Policarpo bay . 564
- S. Rafael bay . 232
- S. Rafael point . 396
- S. Ramon:
  - Bay . 563
  - Colony . 241
  - Village . 563
- S. Remigio village . 448
- S. Ricardo town . 577
- S. Rita island . 581
- S. Rita village . 581
- S. Roque:
  - Channel . 591
  - Village; Cateel bay . 626
  - Village; Dinagat . 591
  - Village; Panay . 333
- S. Rosa village . 470
- S. Rosario town . 338
- S. Sebastian river . 439
- S. Sebastian village . 457
- S. Sophia canal . 482
- S. Teresa hill . 43
- S. Teresa village . 43
- S. Vicente:
  - Bay . 531
  - Island . 502
  - Port . 502
    - anchorages . 503
    - buoy . 502
    - dangers . 502
    - directions . 503
    - light . 502
    - tidal streams . 503
  - River . 488
  - Village; Catalaban island . 566
  - Village; Iligan bay . 488
- S. Victor island . 627
- Saac islet . 469
- Saac point . 404
- Saak point . 404
- Sabag river . 424
- Saban point . 411
- Sabang:
  - Point; Luzon . 393
  - Point; Romblon island . 340
    - light . 341
  - River; Gubat, Port . 427
  - River; Luzon . 393
  - Town . 551
    - light . 551
- Sabankat islet . 161
- Sabariog bay . 422

Page

- Sabil point . . . 447
- Sabino reef . . . 63
- Sablayan:
  - Anchorage . . . 40
  - Island . . . 393
  - Point; Mindoro . . . 40
  - Point; Romblon . . . 341
  - Town . . . 40
- Saboncogon point . . . 349
- Sabonkogon point . . . 349
- Saboon island . . . 386
- Saboruko point . . . 90
- Sacamalig bay . . . 561
- Sacay point . . . 408
- Sacol hill . . . 247
- Sacol island . . . 247
- Sacramento rock . . . 361
- Sadam bay . . . 278
- Saddle:
  - Hill . . . 177
  - Islands . . . 167
  - Peak . . . 283
  - Rock . . . 57
- Saduc islet . . . 252
- Sagai:
  - Point . . . 442
  - Pulau . . . 167
  - Town . . . 443
- Sagay:
  - Point . . . 442
  - Town; Camigin island . . . 494
  - Town; Negros . . . 443
- Sagasae islet . . . 612
- Sagasai islet . . . 469
- Sagasay islet . . . 469
- Sagausauan point . . . 400
- Sagayaran island . . . 269
- Sagbungon point . . . 520
- Sagby point . . . 284
- Sagnay point . . . 553
- Sagnay town . . . 554
- Sagui point . . . 222
- Saguit inlet . . . 90
- Sagurun, Mount . . . 389
- Sail rock; Maqueda channel . . . 541
- Sail rock; Sulu archipelago . . . 191
- Sail rocks; Calamanian group . . . 49
- Saima point . . . 179
- Saingan point . . . 586
- Saint. *See* under S at beginning of letter
- Sakai point . . . 408
- Sakamalig bay . . . 561
- Sakar island . . . 155
- Sakol hill . . . 247
- Sakol island . . . 247
- Salakan islet . . . 161
- Salamanca river . . . 449
- Salamanca village . . . 449
- Salang channel . . . 203
- Salang Salangan channel . . . 206
- Salanga village . . . 573
- Salasala point . . . 631
- Salatan point . . . 273
- Salauang point . . . 274
- Salaysay point . . . 510
- Salcedo village . . . 574
- Saley point . . . 515
- Salimbubuc island . . . 64

Page

- Salimbubuk island . . . 64
- Salingsingan island . . . 109
- Salinsagin point . . . 562
- Salipsip point . . . 512
- Salkulakit islet . . . 228
- Salobot islet . . . 532
- Salog islet . . . 361
- Salomague island . . . 380
- Salomague point . . . 380
- Salong point . . . 358
- Salong reef . . . 363
- Salongsogon point . . . 42
- Saloro island . . . 227
- Saluag islet . . . 146
  - Light . . . 146
- Salun point . . . 298
- Saluping island . . . 225
- Salvacion:
  - Island . . . 55
  - Town; Busuanga island . . . 55
  - Village; Mindanao . . . 620
- Salvaria islet . . . 377
- Samal island . . . 293
- Samal village . . . 293
- Samales group . . . 221
  - Tidal streams . . . 224
- Samar island:
  - Eastern side . . . 560
    - climate and weather . . . 16
  - Northern side . . . 430
  - Southern side . . . 573
  - Western side . . . 414
    - islands and dangers . . . 414
- Samar sea . . . 420
  - Islands and dangers . . . 420
  - Light . . . 420
- Samarang point . . . 112
- Sambauan islets . . . 420
- Sambilong island . . . 197
- Samboan town . . . 457
- Sambulauan hill . . . 268
- Sambulauan, Port . . . 268
- Sampanmangio, Tanjong . . . 122
- Sampetan point . . . 610
- Sampinitan creek . . . 273
- Sampoak point . . . 243
- Sampotan islet . . . 532
- Samputan:
  - Pass . . . 582
    - beacons . . . 582
    - buoys . . . 582
  - Point . . . 582
  - Village . . . 581
- Samson patches . . . 115
- Samur island . . . 525
- San. *See* under S at beginning of letter.
- Sanco point . . . 624
- Sand point . . . 527
- Sandakan harbour . . . 139
  - Anchorage . . . 140
  - Bar . . . 139
  - Beacon . . . 139
  - Light-buoy . . . 139
  - Dangers . . . 139
  - Port limits . . . 141
- Sandakan town . . . 140
  - Climatic table . . . 30
  - Communication . . . 140

Page
Sandakan town—*contd.*
  Harbour facilities 140
  Radio station. 14
  Tidal signals 140
  Trade 140
  Wharf 140
Sandilands rock. 124
  Light 124
Sandingan island 472
Sandoval point 373
Sandugan point. 478
Sandy island 132
  Beacon 132
Sandy point 506
Sanga Sanga channel 196
Sanga Sanga island 147
Sangabon point. 410
Sangasiapu islet. 201
Sangat cove 466
Sangay point 279
Sangay river 279
Sangboy islands. 228
Sangirin :
  Bay 516
    light 516
  Point 516
  Village 517
Sanko point 624
Santa. *See* under S at beginning of letter
Santander town. 468
Santiago :
  Cape 306
    light 306
  River 309
  Settlement 588
  Village ; Mindanao. . . . 628
  Village ; Panay 362
Santo. *See* under S at beginning of letter
Santol bay 520
Sanz island 103
Saong bay 261
Saonloc bay 562
Sapagaya bay 139
Sapao town 599
Saparoak point 111
Sapenitan bay 530
Sapenitan point. 530
Sapian bay 351
Sapian peninsula 351
Sapu bay 283
Saranga, Pulau 167
Sarangani :
  Bay 282
    anchorages 283
  Islands 285
    light 285
  Strait 285
Sarap point 96
Saravia town 363
Sardine reef 42
Sarmiento point 103
Saro point 253
Sarraceno bank 47
Sarucsarucan island 206
Sarva point 257
Sasa island 203
Sasaigan point 340

Page
Satan rock 615
Sauang pass 472
Sawigan point 244
Sayan islet 421
Sayao bay 378
Sayao island 603
Sayug channel 600
Schuck reef 130
Scott point 95
Sebaste shoal 333
Sebaste village 333
Sebik island 61
Sebonbon cove 547
Seboto point 254
Sebu, *see* Cebu
Secam island 101
Seco islet 334
Seco reef 596
Secubun island 203
Sedam island 186
Sedgeman rock 132
Segama river 143
Segannen river 154
Sekam island 101
Seko islet 334
Sekubun island 203
Selungan point 276
Semaruga point. 276
Semawang, Tanjong 137
Sembakung heuvels 187
Sembakung, Sungei 187
Semirara :
  Anchorage 325
  Island 325
  Islands 325
  Town 325
Semporna settlement 174
Senelak island 187
Sentry bank 144
Sepoc point 310
Sepok point 310
Serantes shoal 216
Seraray islet 365
Serudong river 184
  South-eastern approach . . 186
Sesajap delta 187
Seygam islands 96
Shark Fin bay 79
  Anchorage 79
  Directions 79
  Off-lying islands and dangers . 79
Shark Fin peak 81
Sharp :
  Hill 85
  Peak ; Luzon 426
  Peak ; Negros 440
  Peak ; Palawan 88
  Peak ; Zamboanga peninsula . 248
  Point ; Batan island . . . 551
  Point ; Siargeo island . . . 595
  Shoulder ; Palawan . . . 81
Shell island 87
Sheppard reef 164
Shoal point 154
Si Amil island 171
Si ba ung reef 135
Siagut point 110
Siagut shoal 110
Siain village 516

Page

Sialat point 542
  Light 542
Siargao island 595
  Eastern and southern sides . 595
Siargao point 389
Siari town 245
Siasi island 211
  Northern and eastern sides . 212
Siasi town 211
  Anchorage 212
Siasib, Tanjong 134
Siakon :
  Point 440
  River 440
  Town 440
Siay river 256
Sibabag settlement 213
Sibago island 239
  Light 239
Sibahong river 165
Sibai island 327
Sibakel island 231
Sibakies rivier 187
Sibala, Mount 353
Sibalatan point 288
Sibale island 594
Sibalic point 244
Sibalik point 244
Sibalom river 335
Sibaltan village 77
Sibalun islet 387
Sibankat, Mount 197
Sibanoc island 593
Sibanok island 593
Sibarut bank 224
Sibaton island 326
Sibaton village 326
Sibatyan point 211
Sibauan island 532
Sibay island ; Samar island . 564
Sibay island ; Semirara islands . 327
Sibetik island 179
  Boundary beacons 179
  Dangers 179
  Off-lying dangers . . . 180
Sibolon island 326
Sibonga :
  Mount 597
  Port 597
  Town 466
Sibono point 384
Sibuan islet 161
Sibuco :
  Bay 242
  Point 242
  Town 242
Sibugai island 421
Sibugay island 421
Sibuguey :
  Bay 248
    eastern side 254
    western side 249
  Mount 256
  River 256
Sibukauan island 592
Sibuko :
  Bay ; Borneo 169
    aspect 169
    head and southern side of . 183

Page

Sibuko : Bay—*contd.*
    northern side and approaches 170
  Bay ; Mindanao 242
  Point 242
  River 186
Sibuku rivier 186
  South-eastern approach . . 186
Sibuku village 187
Sibulan :
  Island 260
  Port 258
    inner part 260
    outer part 258
  Reef 260
  River 260
Sibutu :
  Hill 146
  Island 146
    islands and dangers westward of 148
  Passage 146
    directions 147
    eastern side 147
    tidal streams 147
    western side 146
Sibuyan island 342
  Eastern side 344
  Northern side 343
  South-western side 342
Sibuyan sea 10
  Tidal streams 10
Sicaba :
  Point 442
  Reefs 442
  River 442
  Village 442
Sicagot island 231
Sicalangcalong island . . . 189
Sicayac point 245
Sicayac village 245
Sicmil bay 547
Sicogon :
  Channel 357
  Island 357
Sicopon river 439
Sidongal, Mount 162
Sidongal, Tanjong 162
Sidsid point 62
Sierra Madre 304, 504
Siete Pecados islets 367
  Light 367
Sigaboy island 298
Sigaboy village 298
Sigalong river 162
Sigalong trusan 161
Sigarin point 287
Sigat point 349
Sigayan :
  Bay ; Illana bay 276
  Bay ; Luzon 317
  Point 276
Sigmil bay 547
Signals 11
Sikaba, *see* Sicaba
Sikagot island 231
Sikalangkalong island . . . 189
Sikapal rock 187
Sikaula island 201
Sikayak point 245

Page
Sikayak village 245
Sikihor island 477
Sikihor town 478
Sikogon, *see* Sicogon
Sila point 560
Silacay point 284
Silad:
  Bay 410
  Island 65
  Village 410
Silago river 586
Silago village 586
Silagon island 446
Silagui islet 257
Silai town 363
Silam:
  Harbour 166
    anchorage 168
    directions 168
    islands and dangers . . 166
    tidal streams 169
  Mount 166
  Village 166
Silancapo point 372
Silanga:
  Bay; Palawan 81
  Bay; Samar 417
  Islands 81
  Islet 487
  Peak 81
  Point 487
  Village 81
Silangan:
  Pass 518
    light 518
  Point; Alabat island . . 517
  Point; Marinduque . . . 376
Silangon point 214
Silankapo point 372
Silapag passage 170
Silat islet; Cuyo islands . . 68
Silat islet; Mindoro . . . 324
Silay town 363
Silibukan river 154
Silimpopon river 185
Silingaan islet 135
Silingan, Mount 253
Silino island 484
  Light 484
Silion island 446
Silk island 128
Silla, Mount 485
Silla point 484
Silom village 343
Silonai, *see* Silonay
Silonay:
  Island 316
  River 318
  Village 318
Silong bay 45
Siluag islet 150
Silumisan islet 74
Silumpat island 164
Silungan islet 175
Silut lagoon 402
Simaddel island 130
  Anchorage, directions . . 131
Simalak Dakula island . . . 198
Simalak Sibi Sibi island . . 198
Simanahan channel 108
Simanahan reef 108
Simara island 328
Simatahan river 184
Simengaris rivier 187
Simengaris village 187
Simio point 488
Simisa island 222
Simo banks 305
Simunul island 147
Sinactan point 549
Sinakaban village 489
Sinalog point 549
Sinalong, Mount 157
Sinamangan river 431
Sindangan:
  Bay 244
  Point 244
  Town 245
Singaan island 193
Singag island 622
Sining Capan, Mount . . . 229
Sining Kapan, Mount . . . 229
Sinipai Dako island 485
Sinipay Daco island 485
Sino Solan river 186
Sinonog island 248
Siokun bay 243
Siokun river 243
Sioron cove 547
Sipac island 222
Sipaca point 494
Sipadan island 173
Sipak island 222
Sipaka point 494
Sipalay river 438
Sipangao islet 170
Sipangkot island 148
Sipankot island 148
Siparai islet 66
Siparay islet 66
Sipayu island 198
Sipina islet 485
Sipindung cay 131
Sipit river 162
Siquijor island 477
Siquijor town 478
Sir James Brooke point . . 96
  Light 96
Siraguay point 242
Siraguay river 242
Sirawan river 292
Sirawan village 292
Siringo island 227
Siruma:
  Bay 528
  Island 528
  Point 528
  Town 528
Sirun island 210
Sisiran bay 535
Sitankai island 148
Sitankai village 148
Situgal Hea island 206
Siyt, Port 441
Skertchley, Mount 158
Skertchley point 165
Soai Soaiun bay 166
Sobog bay 547

Page
Sobok bay 547
Socorro river 598
Socorro village 598
Sogocan cove 548
Sogod:
  Bay; Cebu 404
  Bay; Leyte 482
    light 482
  Cove 581
  Point 586
  Town; Cebu 403
  Village; Leyte 483
Soguicay:
  Bay 322
    anchorage 322
  Island 322
  Village 323
Soguikai village 323
Soguikay, *see* Soguicay
Sohoton:
  Point; Catanduanes island . 547
  Point; Negros 437
  Point; Samar 420
Sohutan bay 608
Sohutan inlet 608
Sojoton point; Negros . . 437
Sojoton point; Samar . . 420
Sokorro village 598
Solaton island 491
Solitario:
  Islet 390
  Mount 444
  Rock 64
Solodon islet 537
Sombocogon bay 382
Sombokogon bay 382
Sombrero:
  Island, Palawan . . . 93
  Islet; Maqueda channel . . 539
  Islet; Maricaban island . . 310
  Islet; Panay 359
  Islets; Burias 387
  Rocks 69
Sondara river 418
Song Lupa village 265
Sora cay 562
Soribao river 569
Soribao village 569
Sorsogon:
  Bay 391
    anchorages 392
    directions 392
    entrance 392
    lights 392
    submarine cable . . . 393
  Province 392
  Town 393
    storm signals 11
Sostoa bank 347
South bay; Linapacan island . 62
South cay; Pamalican group . 55
South channel; Caramay harbour 87
South channel; Catbalogan
    approach 416
South channel; Halsey harbour . 57
South harbour; Balambangan
    island 111
  Anchorage, directions . . 112
South islet; Tabgon anchorage . 537
South islet; Tubbataha reefs . 71
South pass; Verde Island passage 314
  Light 315
  Southern side. 315
South point; Guimaras island . 365
South shoal; Lumbucan island . 107
South Bais bay 458
South Channel dangers . . 118
South Gigante island . . . 355
South Lahatlahat island . . 192
South Malbinchilao island . . 56
South Mangsi island . . . 109
South Ubian island . . . 207
South Verde island . . . 87
South-east shoals; Great Danger
    bank 108
South-east Banguey dangers . 118
South-west anchorage; Cagayan
    Sulu 74
South-west bank; Sulu sea. . 72
South-west bluff; Simaddel island 130
South-western bank; Balabac
    island 105
Standard time 15
Stanlake island 87
Steenen Nuk 179
Steepfall range 103
Stewart peaks 158
Stone point 179
Storm signals; Philippine islands. 11
Straggler island 119
Sua:
  Bay 574
  Islets 622
  Point 575
Suanbato point 270
Suay river 436
Subaang bay 315
Subai point 332
Suban point 378
Subay point 332
Submarine cables 13
Subuan river 276
Subukin point 369
Subunguin point 375
Subunguin reef 375
Subuquin point 369
Sucol river 320
  Light 320
Sugar Loaf point 535
Sugbai island 205
Sugbai passage 208
Sugbu islet 612
Sugbuhan:
  Island 594
  Point 595
  Reef 599
Sugiab point 499
Sugot bay. 555
Sugut bay. 273
Suiro, Mount 411
Sujac, Mount 394
Sujak, Mount 394
Sukol river 320
  Light 320
Sula channel 553

Page

- Sula, Port . . . 557
  - Light . . . 557
- Sulade island . . . 214
- Sulapa islet . . . 533
- Sulat:
  - Bay . . . 566
    - anchorage . . . 567
    - approaches . . . 566
  - River . . . 567
  - Town . . . 567
- Sulauan point . . . 492
- Suligan shoal . . . 222
- Sulpa islet . . . 470
- Sultan:
  - Bank . . . 334
  - Peak . . . 92
  - Range . . . 92
- Sultana shoals . . . 71
- Sulu archipelago . . . 4, 189
  - General remarks . . . 4, 189
  - Tidal streams . . . 189
- Sulu sea . . . 6
  - Currents . . . 9
  - Islands and dangers . . . 70
- Suluan island . . . 584
  - Anchorage . . . 584
  - Light . . . 584
- Sumabun, Pulau . . . 167
- Sumagui village . . . 320
- Sumangul point . . . 260
- Sumangul village . . . 260
- Sumbang point . . . 282
- Sumbasumba island . . . 213
- Sumilon island; Cebu . . . 468
- Sumilon island; Hinatuan passage 615
- Sumlug point . . . 300
- Sumlug river . . . 300
- Sunbeam rock . . . 133
- Sunday bank . . . 144
- Sungei = River, *see* proper name
- Sungi point . . . 572
- Sungu shoal; Bolod islands . 224
- Sungu shoal; Tapul islands . 211
- Suong island . . . 256
- Suribao village . . . 569
- Surigao:
  - Province . . . 613
  - River . . . 613
  - Strait . . . 584
    - eastern side . . . 587
    - general remarks . . . 584
    - western side . . . 585
  - Town . . . 613
    - anchorage . . . 614
    - climatic table . . . 37
    - dangers . . . 613
    - light . . . 613
- Susak rock . . . 504
- Susan islet . . . 365
- Suyac islet . . . 444
- Suyak islet . . . 444
- Suyatun river . . . 605
- Swirl patch . . . 180
- Swirl reef . . . 228
- Syniop, Mount . . . 279

Page

- Taal:
  - Lake . . . 2, 309
  - Town . . . 309
  - Volcano . . . 2
- Taancan point . . . 482
- Taankan point . . . 482
- Taata islands . . . 201
- Taba bay . . . 256
  - Directions . . . 256
- Tabac rock . . . 67
- Tabaco bay . . . 552
  - Anchorage . . . 553
  - Dangers . . . 552
  - Directions . . . 553
  - Lights . . . 552
- Tabaco town . . . 553
- Tabahan river . . . 476
- Tabahin bay . . . 307
- Tabai point . . . 44
- Tabajin bay . . . 307
- Tabak rock . . . 67
- Tabako, *see* Tabaco
- Tabaltabal bay . . . 581
- Tabango bay . . . 410
- Tabango village . . . 410
- Tabanon river . . . 443
- Tabauwan island; Darvel bay . 163
- Tabauwan, Pulau; Silam harbour 167
- Tabawan island . . . 207
- Tabgon anchorage . . . 536
- Tabgon village . . . 536
- Tabignan point . . . 379
- Tabilunay island . . . 227
- Tablas:
  - Island . . . 329
    - eastern side . . . 341
    - western side . . . 329
  - Shoal . . . 191
  - Strait . . . 327
  - Summit . . . 329
- Table head . . . 90
- Table mountain . . . 169
- Taboan river . . . 505
- Taboc island . . . 409
- Tabogan point . . . 560
- Tabogoc cove . . . 544
- Tabogon river . . . 520
- Tabok island . . . 409
- Tabolongan island . . . 204
- Tabon point . . . 468
- Tabonan point . . . 325
- Tabu point . . . 488
  - Light . . . 489
- Tabuan islands . . . 207
- Tabuelan village . . . 452
- Tabugan island . . . 357
- Tabuk island . . . 603
- Tabunan:
  - Islets . . . 590
  - Peninsula . . . 589
  - Point; Masbate . . . 400
  - Point; San Miguel, Port . . 397
  - Point; Tapul island . . 213
  - Village . . . 590
- Tabuntabun point . . . 90
- Tabusao island . . . 521
- Tacaquinay point . . . 629
- Tacbolulu settlement . . . 96
- Tacbubuc island . . . 66

Page

- Tacligan point . 515
- Tacloban:
  - Anchorage . 578
  - Approaches . 577
    - beacons . 577
    - buoyage . 577
    - dangers . 577
  - Buoy . 578
  - Directions . 578
  - Pilots . 578
  - Radio station . 14
  - Storm signals . 11
  - Town . 579
- Taclogan bay . 394
- Tacu shoal . 400
- Tacubtacuban hill . 529
- Tacut reef . 355
- Tacutboata reef . 207
- Taebun channel . 538
- Taft town; Samar . 566
- Taft village; Carabao island . 332
- Tag islet . 533
- Tagabaka:
  - Cove; Dinagat, south-west coast 592
  - Cove; Dinagat, west coast . 590
  - Point . 590
- Tagabas bay . 373
- Tagabibi bay . 297
- Tagabua islet . 165
- Tagabuli bay . 290
- Tagalinog island . 95
- Tagalo point . 269
- Tagalo reefs . 269
- Tagampul islet . 412
- Taganaan Estero . 610
- Taganaan river . 610
- Taganaan village . 610
- Taganak island . 136
  - Light . 136
- Taganak patches . 136
- Taganauan islet . 616
- Taganeto village . 608
- Taganilao point . 630
- Taganilao village . 630
- Tagao island . 209
- Tagapula island . 421
- Tagassan bay . 173
- Tagata point . 278
- Tagauayan islands . 66
- Tagbabui cove . 592
- Tagbac cove . 308
- Tagbak cove . 308
- Tagbanao cove . 297
- Tagbanao point . 297
- Tagbarunis point . 92
- Tagbarunis river . 92
- Tagbayakao islet . 593
- Tagbilaran, Port . 473
  - Anchorage . 474
  - Beacons . 473
  - Directions . 474
  - Light . 473
- Tagbilaran town . 473
- Tagboabo islet . 594
- Tagdaranao islets . 417
- Tagipil islet . 133
- Tagiran point . 394
- Tagita islet . 533

Page

- Tago:
  - Island . 359
  - Pass . 360
  - Reef . 360
  - River . 617
  - Town . 617
- Tagol village . 187
- Tagolo point . 246
  - Light . 246
- Tagoloan river . 493
- Tagoloan town . 493
- Tagubanhan island . 361
- Taguisian point . 257
- Taguite:
  - Bay . 249
  - Island . 249
  - Mount . 249
  - Point . 249
- Tagulaya point . 291
- Tagum:
  - Peaks . 380
  - Point . 380
  - River; Davao gulf . 295
  - River; Marinduque . 379
- Tagun bay . 535
  - Light . 536
- Taguntun bank . 543
- Tagutu island . 227
- Tahao point . 453
- Tahao reef . 453
- Tahidan point . 545
- Tahuruc point . 474
- Tahuruk point . 474
- Taig point . 566
- Tailon island . 523
  - Light . 523
- Taja island . 189
- Tajad point . 447
- Tajao point . 453
- Tajao reef . 453
- Tajau, Tanjong . 122
- Taka river . 126
- Takbubuk island . 66
- Takela island . 231
- Takippamasilaan island . 235
- Takippamasilaan reef . 235
- Takligan point . 515
- Takloban, *see* Tacloban
- Taklogan bay . 394
- Takut reef . 355
- Takut Mataha reef . 197
- Takut Tangug bay . 236
- Takutboata reef . 207
- Talabaan Chico river . 442
- Talabaan Grande river . 442
- Talaban island; Bohol . 469
- Talaban islet; Laguimanoc, Port. 371
- Talabasi point . 40
- Talabe point . 449
- Talabe river . 449
- Talacanen island . 82
- Talaga village . 123
- Talaguilong, Port . 246
- Talagutong village . 287
- Talahi point . 317
- Talaid point . 255
- Talaji point . 317
- Talairan point . 413
- Talakanen island . 82

Page

- Talakitok reef . . . 95
- Talalora village . . . 414
- Talampulan island . . . 54
- Talantam bank . . . 144
- Talaotao point . . . 44
- Talapacan river . . . 271
- Talavera island . . . 611
- Talavera village . . . 611
- Talcauayan bay . . . 387
- Taledom rock . . . 260
- Taliak point . . . 282
- Talibon town . . . 469
- Talicud island . . . 293
- Talicud strait . . . 293
- Talikud island . . . 293
- Talikud strait . . . 293
- Talin bay . . . 305
- Talin point . . . 306
- Talinas islet . . . 307
- Talingting village . . . 479
- Talipanan, Mount . . . 312
- Talipanan point . . . 312
- Talipao, Mount . . . 215
- Talisai, *see* Talisay
- Talisay:
  - Bay; Davao gulf . . . 299
  - Bay; Ticao island . . . 398
  - Island . . . 429
  - Point; Cebu . . . 465
  - Point; Davao gulf . . . 297
  - Point; Masbate . . . 347
  - Point; Semirara island . . . 325
  - Reef . . . 299
  - River . . . 382
  - Town; Cebu . . . 462
  - Town; Negros . . . 363
- Talisayan point . . . 336
- Talisayan town . . . 496
- Talocoy river . . . 440
- Talomo bay . . . 292
- Talong islet . . . 407
- Taluc island . . . 213
- Taluk island . . . 214
- Talukluk channel . . . 485
- Talukluk islet . . . 486
- Talulu point . . . 242
- Taluluc channel . . . 485
- Taluluc islet . . . 486
- Talusan bay . . . 443
- Tamao point . . . 244
- Tamba river . . . 186
- Tambalan point . . . 287
- Tambang point . . . 532
- Tambang, Port . . . 532
- Tambanon river . . . 254
- Tambaron island . . . 323
- Tambaron pass . . . 323
- Tambatan point . . . 268
- Tambi point . . . 323
- Tambisan island . . . 143
- Tambisan point . . . 478
- Tambog point . . . 625
- Tambolian reef . . . 472
- Tambon island . . . 60
- Tambu islet . . . 469
- Tambuc point . . . 629
- Tambuk point . . . 629
- Tambulian:
  - Cay . . . 130

Page

- Tambulian—*contd.*
  - Island . . . 217
  - Point . . . 267
- Tambungan point . . . 589
- Tambungon settlement . . . 296
- Tamburay island . . . 591
- Tamehagan point . . . 592
- Tami point . . . 96
- Tamila rock . . . 226
- Tamontaca village . . . 272
- Tamontaka village . . . 272
- Tamoyauas point . . . 589
- Tampel island . . . 60
- Tampel pass . . . 60
- Tampi village . . . 459
- Tampuan point . . . 282
- Tamuk island . . . 229
- Tanao islands . . . 523
- Tanao pass . . . 523
  - Dangers . . . 523
  - Directions . . . 524
  - Lights . . . 523
- Tanauan, Mount . . . 471
- Tanauan town . . . 575
- Tancan island . . . 205
- Tancolaluan island . . . 205
- Tandag:
  - Point . . . 616
  - River . . . 617
  - Town . . . 616
- Tandao rock . . . 347
- Tandican point . . . 217
- Tandikan point . . . 217
- Tando Bulong, Trusan . . . 173
  - Beacons . . . 174
  - Directions . . . 174
  - Tidal streams . . . 174
  - Tides . . . 174
- Tando point . . . 257
- Tandoc village . . . 531
- Tandog island . . . 366
- Tandotao, Tanjong . . . 73
  - Light . . . 73
- Tandu Bato village . . . 220
- Tandu peak . . . 217
- Tandubas island . . . 203
- Tandubatu island . . . 205
- Tandungan channel . . . 206
- Tandungan island . . . 206
- Tang point . . . 426
- Tangad island . . . 419
- Tangad Libucan island . . . 419
- Tangad Libukan island . . . 419
- Tangaion point . . . 327
- Tangat island . . . 56
- Tangcocoloan rocks . . . 264
- Tangil point . . . 454
  - Light . . . 454
- Tangil village . . . 454
- Tangkokoloan rocks . . . 264
- Tanglar island . . . 529
- Tanglar point . . . 529
- Tango point . . . 283
- Tangu island . . . 200
- Tanguingui islet; Burias . . . 387
- Tanguingui islet; Visayan sea . . . 356
  - Light . . . 356
- Tanguip point . . . 626
- Tangusu bay . . . 144

Page
Tanhai river 459
Tanhai town 459
Tanj Bungaan island 129
Tanjay river 459
Tanjay town 459
Tanjong = Point, *see* proper name
Tankan island 205
Tankolaluan island 205
Tanna, Pulau 164
Tanna Ballu, Mount 162
Tanoban point 524
Tanobon island 49
Tañon point 457, 468
Tañon strait 448
  Eastern side of northern part 451
  Northern approach 445
    islands and dangers 445
    lights 445
  Southern part 455
  Tidal streams 448
  Western side of northern part 449
Tanquique rock 217
Tantanang bay 261
Tantanang point 261
Tantangon island 56
Tantauayan, Mount 437
Tanuan point 385
Tanun point 216
Tanusa island 70
Taon river 625
Tapaan:
  Island 208
  Passage 208
    dangers 209
  Shoal 209
Tapian point 271
Tapian reef 271
Tapiantana:
  Channel 225
    tidal streams 226
  Group 224
    anchorages 225
    dangers 224
  Island 224
Tapilon point 447
Tapilon village 447
Tapul:
  Bay 89
  Island 213
  Islands 210
Tara island; Mindoro strait 46
Tara island; Tapul islands 212
Tarahid point 544
Tarangnan point 417
Tarangnan town 417
Taratara islet; Samar 415
Taratara islet; Tapul islands 212
Targett rock 122
Tarigtig point 507
Tarinen point 199
Taris point 549
Taritipan river 127
Tarlac reef 514
Tarlak reef 514
Tarragona village 629
Tasiran point 395
Tataan islands 198
Tataan pass 199
  Directions 199

Page
Tatagan island 160
Tataidaga point 630
Tatal rocks 252
Tatalan island 223
  Light 224
Tatus islet 398
Tauitaui island 218
Tausan Mariki channel 201
Tavotavo, Tanjong 73
Tawau:
  Point 181
  River 180
  Town 181
    anchorages 181
    approach 180
    communication 181
    directions 181
    harbour facilities 181
    light 181
    pier 181
    radio station 14
    tidal streams 181
Tawitawi:
  Bay 199
    anchorage 203
    directions 203
    northern side 200
    tidal streams 204
  Group 195
    islands and dangers north of 192
  Island 197
    islands and dangers off N.E. side 204
    northern coast 197
    tidal streams 199
Tayabas bay 369
  Climate and weather 16
  Head of 370
  North-eastern side 371
    anchorages 371
    dangers 371
    lights 371
  Western side 369
Tayabas point 370
Tayabas river 369
Tayasan point 456
Tayasan town 456
Taynabo point 253
Tayong:
  Peak 474
  Point 454
  Village 474
Taytay:
  Bay 81
    anchorage 83
    directions 83
    eastern approach 82
    north-eastern approach 81
  Fort 83
  Head 83
  Point 583
  Village 83
Taytayan islet 280
Taytayan point 304
Tegarangan river 123
Tegolting point 259
Tehada reef 80
Teinga island 228
Tejada reef 80

Page
Telegrafo village 411
Telegraph:
  Islet 608
  Mount 612
  Point 313
Teloh Sibet river 153
Telok Bukan settlement . . 155
Tembalan rock 187
Templo island 387
Ten-foot rock 117
Tending island 57
Tenga river 125
Tengolan island. 231
Tenotungan point 278
Teomabal:
  Bank 194
  Island; Jolo island . . . 216
  Island; Pengutarang group . 194
Teresa bank 543
Tern rock. 124
Ternate bay 422
Tetabuan, Pulau 137
Tetas de Kataingan 401
Tetian bay 274
Three-peaked hill 139
Three peaks, Mount 407
Thumb:
  Hill; Tawitawi island . . 197
  Peak; Balambangan island . 110
  Peak; Honda bay . . . 90
  Peak; Luzon 505
Thurston rock 525
Tiain point 286
Tibakkan cay 130
Tibiao:
  Point 335
  River 335
  Town 335
Tibiauan river 456
Tiblawan creek 298
Tiblawan village 298
Tibungko settlement . . . 296
Ticala islets 269
Ticao:
  Bay 395
  Island 394
    eastern side 394
    islands and dangers off south end 396
    light 394
    western side 397
  Pass 394
Ticauan point 255
Ticlin:
  Island; Ticlin strait . . . 425
  Islet; Tañon strait . . . 449
  Point 320
  Reef 449
  Strait 425
    directions 426
Tictauan:
  Channel. 247
    anchorage 247
    directions 247
  Island 238
  Shoal 247
Ticul island 194
Tidal streams, general remarks . 10

Page
Tidepole point 90
  Light 90
Tidung Salang, Tanjong . . 187
Tiga islet 112
Tigabon island 263
Tigabu island 130
Tigao village 616
Tigasamil spit 124
Tigasamil, Tanjong 123
Tigbaon islands. 249
Tigbauan islands 249
Tigbucay bay 250
Tigbucay point 250
Tigburacao island 249
Tigburakao island 249
Tigdos island 623
Tiger hill 169
Tiglauigan village 443
Tigman river 93
Tiguihan cove 319
Tiguilaban islet. 227
Tijitiji islands 202
Tijitiji reef, beacon 202
Tikao, *see* Ticao
Tikauan point 255
Tiklin, *see* Ticlin
Tiktauan, *see* Tictauan
Tikul island 193
Tikus, Pulau 137
Tilig, Port 307
Tilig settlement. 307
Timaco hill 272
Timba Timba islet 158
Timbo river 298
Timbu Mata island 162
  Islands and dangers north and north-west of 163
  Northern side. 163
Timbu Mata, Tanjong . . . 161
Timbungan island 225
Timon point 423
Timpasan island 418
Tina Basan island 186
Tina Basan, Trusan 186
Tinaan anchorage 465
Tinabog river 88
Tinabog village 88
Tinabooc village 325
Tinabook village 325
Tinaca point 283
  Light 284
Tinacos islet 392
Tinaga cove 588
Tinaga island 524
Tinago:
  Cove; Leyte 410
  Cove; Luzon. 504
  Mount 504
  Village 410
Tinagong—Dagat bay . . . 520
Tinagongdagat inlet 352
Tinagta island 198
Tinajuagan point 535
Tinalisayan islets 387
Tinalmud river 385
Tinambac village 529
Tinambak village 529
Tinang islet 340
Tinanogan bay 390

Page
Tinao islet 592
Tinaogan:
  Point 580
  Reef 456
  Village 456
Tinau island 429
Tinayunga, Mount 333
Tincalan islet 212
Tincansan islet 411
Tindug point 405
Ting-kaiu river 165
Tinggeri reef 156
  Beacons 156
Tingib point 578
Tingit village 333
Tinig bay 519
Tinig river 519
Tinigrapo point 581
Tiniguiban village 77
Tinituan island 65
Tinkalan islet 212
Tinkansan islet 411
Tinta point 421
Tintiman island 477
Tinuibo islet 468
Tinukawan point 557
Tinundukan island 202
Tinutungan islet 227
Tipolo point 331
Tirana rock 224
Titangcob island 58
Titangkob island 58
Tiwi point 553
Tobac village 259
Tobak village 259
Tobogan town 404
Tocanhi point 199
Togoron bay 397
Tokanhi point 199
Toledo town 453
Tolen point 211
Tolibas village 153
Tolong:
  Bay 439
  River 439
  Town 439
Tolonpisa island 224
Tolosa town 583
Tomajo rock 621
Tomalaytay islet 392
Tomanday river 614
Tomasa islet 412
Tominobo village 492
Tominongton point 548
Tomonton point 363
Tomonton shoal 363
Ton Sandungan channel . . . 223
Tona channel 600
Tona island 600
Tonga point 478
Tongehatan point 199
Tongo point; Copton peninsula . 455
Tongo point; Romblon island . 340
Tongon point 384
Tongquil island 222
  Islands and dangers northward of 223
  light 224
Tonkil island 222
Tonkil point 626
Tonquil point 626
Tood islets 469
Topocan point 255
Torongohok island; Borneo . 134
Torongohok island; Labuk bay . 137
Torre island 580
Torres reef 63
Torrijos bay 381
Torrijos town 381
Totoog point 423
  Light 423
Toyo reef 365
Toytoy point 541
Tran village 279
Tran Grande river 279
Trang, Tanjong 145
  Light 145
Transept hill 104
Tranpichihan point 379
Traverse island 183
Tree rock; Labuk bay approach . 136
Tree rock; Mallawallé channel . 128
Tres Marias point 390
Tres Marias rocks 60
Tres Reyes islands; Marinduque . 378
Tres Reyes islets; Linapacan strait 59
Triana village 482
Trinidad village 420
Tristan, Mount 592
Triton island 263
Triton rocks 606
Trusan = Channel, *see* proper name
Tuad islet 351
Tuason point 596
Tubabao island 564
Tubahon bay 589
Tubahon village 589
Tubajon bay 589
Tubajon village 589
Tubalan head 287
Tubalan, Port 287
Tubalubac island 191
Tubalubak island 191
Tubay:
  Mount 497
  Point 496
  River 498
  Town 498
Tubbataha reefs 71
Tubig point 371
Tubig river 565
Tubigan:
  Island 194
  Point; Libas, Port . . . 567
  Point; Panay 335
    light 335
Tubigon town 471
Tubile point 39
Tubili point 39
Tubingantan point 214
Tubotubo islet 279
Tubud point 246
Tubug island 64
Tuburan:
  Bay 452
  River 452
  Town 452

Page
Tucabadoc point 269
Tucat reef. 352
Tuctuc point 331
Tudela :
  Town ; Poro island . . 407
  Village ; Calandagan island . 86
  Village ; Iligan bay . . 489
Tuganay river 295
Tugapangan point . . . 273
Tugas :
  Peninsula 607
  Point ; Bohol 468
  Point ; Mindanao . . . 607
Tugasan point 565
Tugbungan point 328
Tugdan point 341
Tugnug point 570
Tugubun point 628
Tuhud island 319
Tujud island 319
Tuka bay 276
Tuka village 276
Tukat reef 352
Tukian point 373
Tuktuk point 331
Tukuran river 270
Tukuran village. 270
Tulayan island 220
Tulian islet 217
Tulnalutan island 248
Tuludan river 269
Tulunanaun island 354
Tuma reef. 347
Tumadgo point 630
Tumaguin islet 358
Tumalaytay island 346
Tumalaytay point 346
Tumalum point. 328
Tumalung bay 261
  Anchorages 261
  Directions 261
Tumanao, Port 286
Tumano islet 624
Tumao point 244
Tumaras point 552
Tumatangas, Mount 214
Tumatum point. 347
Tumbaga point 307
Tumbagaan island 205
Tumindao island 148
Tumulaya point 512
Tuna :
  Bay 280
  Point 279
  Reef 59
Tundalara, Mount 48
Tunganan bay 250
Tungao point 325
Tungauan bay 250
Tungbanghan point 202
Tunggo point 327
Tungku point 153
Tungku river 153
Tungo point 591
Tuntung point 319
Tupilac hill 252
Tuquian point 373
Turia rock 361
Turner patch 154

Page
Turnina islet 355
Turtle bay 92
Tusk peak 41
Tutop, Tanjong. 174
Tutu bay 216
Tutu point 216
Twin :
  Islets 591
  Peaks ; Lamon bay . . . 515
  Peaks ; Valley cove . . . 505
  Rocks ; Luzon 525
  Rocks ; Semirara island . . 325
Typhoon harbours 22
Typhoon signals 11
Typhoons, general remarks. . . 20

Uacac island 416
  Light 416
Uag point. 452
Uakak island 416
  Light 416
Uala islands 514
Uañgon creek 299
Uanivan island 630
Uaydahon islet 355
Uaydajon islet 355
Ubai town 469
Ubaldo reef 78
Uban point 580
Ubay town 469
Ubian island, North 193
  Light 194
Ubian island, South 207
Ugamut island 431
Uguis islet 564
Ulan bay 377
Ulan point 377
Ulut river. 565
Umanun point 618
Umbakanan river 289
Umiray river 510
Unamao island 605
Unarang rock 180
Ungai point 551
  Light 551
Ungay point 551
  Light 551
Unib island 593
Union :
  Reef 512
  River 596
  Village 596
Unisan islets 365
Unisan town 372
Unsang, Tanjong 151
Urai Vanoa rocks 419
Uray Vanoa rocks 419
Urdaneta harbour 428
Ursula island 98
Usada island 194
Uson :
  Bay 400
  Island ; Coron passage . . 52
  Islands ; San Juanico strait . 580
  Point 411
  Port 53
  Village 400
Usucan point 486
Usucan shoal 486

Page
Usukan point 486
Usukan shoal 486
Utara point 273

Valencia town ; Bohol . . 475
Valencia village ; Bislig bay . 625
Vallehermoso town . . . 451
Valley cove 505
Valley head 505
Valparaiso shoal 72
Vanguardia islet 62
Varadero bay 315
  Anchorages 315
  Light 315
Varadero point 315
Venus point 599
Verde :
  Hill 394
  Island ; Verde Island passage . 314
  Islands ; Green Island bay . 87
  Island passage 309
    northern side . . . 309
    southern side . . . 312
Victoria peaks 92
Victorias river 363
Victorias town 363
Vigia hill 348
Vigia point 575
Villa Hermosa point 407
Villaba bay 409
Villaba village 409
Village bay 93
Village rocks 90
Villalobos reef 433
Villamil rock 216
Villareal bay 415
Vina, De la 451
Vinagre reef 91
Viñas river 387
Vinticayan point 548
Viola reef 107
Virac :
  Bank 543
  Point 543
  Town 543
    light 543
Virai islet 593
Virak, *see* Virac
Viray islet 593
Visayan sea 356
  Islands and dangers . . 356
  Light 356
Viscaya, Mount 551
Vitali point 249
Vito point. 444
Volata island 70
Voorwyk reefs 156
  Beacons 156

Wagas point 385
Wakefield shoal. 98
Walan island 193
Walker shoal 574
Walton reef 164
Wanderer reef 167
Waray Bancoa reef . . . 416
Watson ridge 185
Wawa river 305
  Light 305
Wayside rock 330
Webb shoal 171
West bank ; San Miguel islands . 72
West entrance ; Mitford harbour. 120
West islet ; Mallawallé channel . 118
West point ; Balabac island . 105
West point ; Clarendon bay . 105
West Bolod island 224
West Circe shoal 255
West Nalaut island . . . 55
West Pasig shoal 88
Western shoals ; Balabac island . 105
Whale rock 606
Wheeling peak 508
White passage ; Dalrymple harbour 220
White rock ; Kudat harbour . 124
White rock ; Libarran island . 136
White rock ; Sulu sea . . 69
White rock ; Tigbauan islands . 250
Wicks rock 181
Willcox bank 74
Wise hill 167
Witti rocks 124
Woodhall reefs 167
Woody island 126
Wright :
  Shoal ; Samar 432
  Shoal ; Sulu sea . . . 98
  Town 416
Wüllerstorf, Mount . . . 169
Wyatt, Mount 157

Yako point 629
Yao islet 446
Yellow rock 512
Yeso island 397
Ynantagung, Mount . . . 77
Yog point. 539
Yopoquit point 536

Zabala reef 87
Zamboanga :
  Peninsula 239
  Province 239
  Town 239
    anchorage 240
    berthing facilities . . 240
    buoy 239
    climatic table . . . 32
    communication . . . 240
    deratisation 240
    harbour facilities . . 240
    harbour limits . . . 240
    radio station . . . 14
    storm signals . . . 240
Zamboanguita point . . . 441
Zamboanguita town . . . 441
Zapato Mayor island . . . 354
Zapato Menor island . . . 354
Zaragoza village 594
Zau island 189
  Light 189
Zayao islet 548
Zebra reefs 126
Zumarraga channel . . . 414
Zumarraga town 414

PUBLICATIONS
of the
HYDROGRAPHIC DEPARTMENT.

A complete list of the Sailing Directions, Charts and other works published by the Hydrographic Department of the Admiralty, together with a list of Agents for their sale, is contained in the "Catalogue of Admiralty Charts and other Hydrographic publications," published annually.

The list of Agents, referred to above, and from whom this catalogue can be obtained, is also promulgated in Admiralty Notice to Mariners No. 2 of each year.

Printed in Great Britain under the Authority of HIS MAJESTY'S STATIONERY OFFICE
by Butler & Tanner Ltd., Frome and London.

Ps. 10328. Wt. 32457/H4208. 2/51. B. & T. Ltd. Gp. 460/1.

Gt. Brit. Hydrographic Office. **33**

SUPPLEMENT No. 2—1954

RELATING TO THE

Eastern Archipelago Pilot

VOL. I

SIXTH EDITION, 1950

CORRECTED TO 22nd APRIL, 1954

Whenever reference is made to the Pilot,
this Supplement must be consulted

Crown Copyright Reserved

LONDON
PUBLISHED by the HYDROGRAPHIC DEPARTMENT, ADMIRALTY

To be obtained from the
Agents for the Sale of Admiralty Charts

1954

Gratis to purchasers of Eastern Archipelago Pilot, Vol. I

ADVERTISEMENT TO SUPPLEMENT No. 2

This Supplement has been compiled by Captain F. J. B. Gibson, O.B.E., R.N., from information received in the Hydrographic Department of the Admiralty, relating to the Eastern Archipelago Pilot, Vol. I, Sixth Edition, since its publication in 1950.

This Supplement should be retained intact for reference ; its existence is to be noted on the tabular form inside the cover of the Pilot.

Whenever reference is made to the Pilot, this Supplement must be consulted.

Attention is drawn to the portions which differ from the *previous Supplement* and which are indicated in the following manner :—

Additions or alterations are enclosed in broad square brackets in heavy type.

Deletions are indicated by a heavy horizontal line.

Supplement No. 1, 1952, is hereby cancelled and all information affecting the Eastern Archipelago Pilot, Vol. I, 1950, contained in Notices to Mariners, up to and including No. 899 of 1954, has been embodied in this Supplement ; for temporary and preliminary Notices to Mariners affecting this edition, the list of temporary and preliminary Notices to Mariners in force, published monthly in the complete weekly edition of the Admiralty Notices to Mariners, should be consulted.

A. DAY,
Vice-Admiral,
Hydrographer of the Navy.

Hydrographic Department,
Admiralty, London,
22nd April, 1954.

1562971

SUPPLEMENT No. 2, 1954

relating to the

Eastern Archipelago Pilot

VOL. I

SIXTH EDITION, 1950

(*Corrected to 22nd April, 1954*)

CAUTION on front cover.—Line 3: *For* " **16** " *read* " **[19]** "
Line 9: *Delete.*
Line 10: *For* " IV " *read* " III "
Lines 12-13: *Delete* " **STUDY** " to " **MARINERS.** " and *substitute*:—
AGENTS FOR SALE OF CHARTS AND HYDROGRAPHIC PUBLICATIONS.
Line 14: *Delete* " **BRITISH** "
Line 15: *Before* " **MERCHANT** " *insert* " **BRITISH** "
After line 17 *insert*:—
No. 3B OFFICIAL RADIO MESSAGES TO MERCHANT SHIPS. The Mercast system.
Line 29: *For* " **W/T AND R/T** " *read* " **RADIO** "
Line 31: *For* " **AIRCRAFT MOORING BUOYS** " *read* " **MINE-SWEEPING OPERATIONS** "
Line 34: *For* " **TELEGRAPH** " *read* " **SUBMARINE** "
After line 42 *insert*:—
No. 17 REPORTS OF SHOALS OBTAINED BY ECHO SOUNDING.
No. 18 AREAS DANGEROUS DUE TO MINES.
[No. 19 THE INTERNATIONAL HYDROGRAPHIC BUREAU.]

[CAUTION on page after Title page.—Tenth paragraph: *For* " **STEAM** " *read* " **POWER** "**]**

[Page xv.—*Above* page heading *insert*:—

LAWS AND REGULATIONS APPERTAINING TO NAVIGATION.

While, in the interests of the safety of shipping, the Admiralty make every endeavour to include in their hydrographic publications details of the laws and regulations of all countries appertaining to navigation, it must be clearly understood:—

(*a*) *that no liability whatever can be accepted for failure to publish details of any particular law or regulation, and*

(*b*) *that publication of the details of a law or regulation is solely for the safety and convenience of shipping and implies no recognition of the international validity of the law or regulation.***]**

[**Page xvi.**—Lines 3 to 32: *Delete* and *substitute*:—

Small corrections.—

(*i*) When a chart is corrected from the information promulgated in an Admiralty Notice to Mariners (except temporary and preliminary Notices), the year, if not already shown, and number of the notice are entered in the bottom left-hand corner of the chart, e.g.:—

Small corrections, 1947-*903*

Copies of the chart stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents and the Admiralty Chart Depots are corrected by hand from such information.

(*ii*) Prior to 1954, when a chart was corrected from information which was considered of no importance from the standpoint of safe navigation, and which was therefore, not promulgated in an Admiralty Notice to Mariners, the year, if not already shown, and date of the correction were entered on the chart, in one of two ways, in the bottom left-hand corner below the margin and in sequence, with the notations referred to in the preceding paragraph, e.g.:—

Small corrections, 1947—$\boxed{\quad\quad}$—

or Small corrections 1947—(VI.*25*)

These indicated that the chart plate received minor corrections on the 20th May or 25th June, respectively which would appear on later printings.

In such cases copies of the chart held by ships and establishments were not usually replaced by new copies, but in exceptional cases, e.g., when new compasses were inserted, new copies of the charts might be supplied. It should, however, be particularly noted that the absence or corrections represented by square or bracket dates from a chart did not invalidate it for navigation.

(*iii*) Since 1954, in order that more attention may be given to New Editions, Large Corrections and corrections by Notices to Mariners, and for other reasons, the making of minor corrections to Chart plates as in (*ii*) has been discontinued. Information of no importance to safe and convenient navigation is instead recorded for inclusion in the next New Edition or Large Correction; or, for promulgation in a later Notice to Mariners should a change of circumstance alter the importance of the information.

In consequence the small correction date enclosed in a rectangle does not appear later than 1953 on navigational charts. The date within brackets may still appear and is then an indication that magnetic compasses have been corrected for a change in variation.]

Page xix.—Lines 5-6: *Delete* "indicated" to "brackets." and *substitute* "enclosed by broad square brackets in heavy type, and deletions from the previous Supplement are indicated by a heavy horizontal line."

Page xix continued.

Lines 27 and 31 : *For* " IIIA " *read* " III "

Lines 33-34 : *Delete* " Section " to " character."

[Lines 42-56 : *Delete* and *substitute* :—

3. **The Admiralty List of Radio Signals.**—The Admiralty List of Radio Signals is issued as follows :—

Volume I.—Communications.—Comprises particulars of radiotelegraph coast stations, together with general regulations ; it also includes such subsidiary services as medical advice supplied by radio.

Volume II.—Navigational Aids.—Comprises particulars of services from direction-finding stations and radiobeacons including air radiobeacons useful to ships ; also stations giving QTG service and calibration stations ; all relevant codes and regulations will be found in this volume.

Volume III (Part A).—Meteorological Services.—Comprises particulars of weather services provided for the use of shipping, together with relevant codes.

Volume III (Part B).—Meteorological Observation stations.

(*Note : Future editions of Parts A and B will be known as Volumes III and IV, respectively.*)

Volume V.—Comprises particulars of Radio time signals, Uniform time system, navigational warnings and Position fixing systems (Decca, Loran, Consul, etc.).]

[**Page xx.**—Lines 2-6 : *Delete* and *substitute* :—

All corrections subsequent to the date of publication are promulgated in Section VI of the complete weekly edition of Admiralty Notices to Mariners.]

[**Page xxii.**—Lines 55-56 : *For* " astronomical " *read* " geographical "]

[**Page xxiii.**—Lines 3, 12 : *For* " astronomical " *read* " geographical "]

[**Page 5.**—Lines 25-26 : *For* " Netherlands " *read* " Republic of Indonesia "]

Page 13.—*After* line 19 *insert* :—

Indonesian surveying vessels.—Indonesian Government vessels employed on hydrographic surveys or laying beacons, will display the marking prescribed for a vessel employed laying, or lifting, a submarine cable. Government vessels which are displaying these marks must be given a wide berth and passed at moderate speed.

[*After* line 33 *insert* :—

LIFESAVING.—Lifeboats and Life-saving appliances form the principal means adopted for saving life.

The line-throwing apparatus, the principal life-saving appliance, can often be used with effect when a lifeboat is not available ; its success, however, depends largely upon an intelligent co-operation on the part of the crew of the stranded vessel.

Signals.—In accordance with the International Convention for the Safety of Life at Sea, 1948, Chapter V, Regulation 16, the following

Page 13 continued.

signals shall be used by life-saving stations when communicating with ships in distress and by ships in distress when communicating with life-saving stations :—

(*a*) *Replies from shore station to distress signals made by a ship* :—

Signal	*Signification*
By day.—White smoke signal. *By night.*—*White* star rocket.	" You are seen—assistance will be given as soon as possible."

(*b*) *Landing signals for the guidance of small boats bringing away the crew of a wrecked ship* :—

Signal	*Signification*
(i) *By day.*—Vertical motion of a white flag or the arms. *By night.*—Vertical motion of a *white* light or flare. A range (indication of direction) may be given by placing a steady *white* light or flare lower and in line with the observer.	"This is the best place to land."
(ii) *By day.*—Horizontal motion of a white flag or arms extended horizontally. *By night.*—Horizontal motion of a *white* light or flare.	"Landing here highly dangerous."
(iii) *By day.*—Horizontal motion of a white flag, followed by the placing of the white flag in the ground and the carrying of another white flag in the direction to be indicated. *By night.*—Horizontal motion of a *white* light or flare, followed by the placing of the *white* light or flare on the ground and the carrying of another *white* light or flare in the direction to be indicated.	" Landing here highly dangerous. A more favourable location to land is in the direction indicated."

(*c*) *Signals to be employed in connection with the use of shore life-saving apparatus* :—

Signal	*Signification*
(i) *By day.*—Vertical motion of a white flag or the arms. *By night.*—Vertical motion of a *white* light or flare.	*In general*—" Affirmative." *Specifically* :— " Rocket line is held." " Tail block is made fast." " Hawser is made fast." " Man is in the breeches buoy." " Haul away."
(ii) *By day.*—Horizontal motion of a white flag or arms extended horizontally. *By night.*—Horizontal motion of a *white* light or flare.	*In general*—" Negative." *Specifically* :— " Slack away." " Avast hauling."]

Page 14.—Lines 47-51 : *Delete* " San Jose " to " Mati." and *substitute* " Iloilo and Cebu."

[**Page 15.**—Line 33 : *For* " Vol. II " *read* " Vol. V "]

Page 18.—Line 16 : *Delete* " Gale " to " 19) " and *substitute* " Percentage frequency of gales in January, page 19).

Table for converting percentage frequency of gales to gale days per month.

For the area covered by the chart, the table gives the average number of gale days per month corresponding to any given percentage frequency. For example, along the 20 contour, 12 gale days a month, on an average, may be expected.

Percentage frequency of gales . .	1	3	5	10	15	20
Average No. of gale days per month ·	1	2	3½	6½	9	12 "

Page 19.—Figure 3, title : *Delete* and *substitute* :—

Percentage frequency of gales in January (Beaufort force 7 and over).

Page 20.—Line 7 : *Delete* " Gale " to " 21.) " and *substitute* " Percentage frequency of gales in May, page 21, and Table, page 18)."

Page 21.—Figure 4, title : *Delete* and *substitute* :—

Percentage frequency of gales in May (Beaufort force 7 and over).

[**Page 41.**—*After* line 54 *insert* :—

There is a wooden pile beacon about 3 cables eastward of the south-eastern extremity of Caminawit point.]

[**Page 42.**—Line 46 : *Delete* " the " to " on "]
[Line 47 : *Delete* " **Light.**— "]
[Lines 52-53 : *Delete.*]

Page 43.—Line 26: *Delete.*

Page 46.—*After* line 13 *insert* :—

In 1950, a shoal, with a depth of 6 fathoms ($11^{m}0$), the position of which is approximate, was reported to lie about 14 miles south-south-westward of Apo Island light-structure.

[**Page 48.**—Line 46 : *After* " **Anchorages.**— " *insert* " **Beacons.**—"]

[**Page 49.**—Line 5 : *After* " coast " *insert* " ; the island thus formed is known locally as Calauit island "]

[Line 9 : *Add* :—There is a wooden pier, with a depth of 7 feet ($2^{m}1$) alongside its head, about a quarter of a mile north-westward of Minuit.]

[*After* line 28 *insert* :—

The north-western approach to the pier at Aran, in the south-western corner of a bay about 5 miles south-eastward of Port Caltom, is marked by four beacons, each consisting of a steel pipe, 8 feet ($2^{m}4$) high ; the two outer beacons are surmounted by a drum.]

[**Page 50.**—Line 41 : *After* " **Dangers.**— " *insert* " **Beacons.**— "

[Line 52 : *Add* :—Inside the western entrance point to the port there is a small wooden pier, with a depth of 12 feet ($3^{m}7$) alongside its head. The channel leading to the entrance is marked by two beacons on both its northern and its southern sides.]

Page 53.—Line 30 : *Delete.*

[**Page 54.**—Line 24 : *Delete* " shoal " to " it." and *substitute* " rock, awash."]
[Line 40 : *After* " point " *insert* " ; a tower stands near the northern end of the island "]

[**Page 56.**—Line 23 : *Add* :—There is a small pier, privately maintained, with a depth of 13 feet ($4^{m}0$) at its head, on the eastern side of the southern end of Dicoyan island.]
[Line 46 : *After* " of it " *insert* " ; there is a pier, with a depth of 13 feet ($4^{m}0$) at its head on the northern side of the eastern end of Lajo island, and another, with a depth of 25 feet ($7^{m}6$) at its head, on the northern side of Darab islet "]

Page 61.—Lines 25-26 : *Delete.*

[**Page 71.**—Line 39 : *Add* :—A disused lighthouse on South islet is a good landmark.]

[**Page 72.**—Line 34 : *Add* :—Discoloured water was reported, in 1953, about one mile northward of the shoal.]

Page 73.—*After* line 16 *insert* :—
In 1951, shoals, with depths of 10 and 11 fathoms ($18^{m}3$ and $20^{m}1$), were reported to lie about 9 miles west-south-westward and 4½ miles south-south-eastward, respectively, of Memnon shoal. [In 1952, a depth of 8½ fathoms ($15^{m}5$) was reported to lie about 9½ miles west-south-westward of the shoalest part of Memnon shoal.]
[Line 38 : *After* " tower," *insert* " 32 feet ($9^{m}8$) in height,"]
[Line 44 : *For* " 311 feet ($94^{m}8$) " *read* " 173 feet ($52^{m}7$) "]

[**Page 74.**—*After* line 8 *insert* :—
A 4½-fathom ($8^{m}2$) patch lies about 2½ miles north-westward of Pamelikan island. Many shoals lie in an area about 3¼ miles north-eastward of Pamelikan.]
[Line 25 : *For* " 283 feet ($86^{m}3$) " *read* " 236 feet ($71^{m}9$) "]

Page 75.—Lines 12-13 : *Delete.*

[**Page 77.**—Line 6 : *Delete* " depth " to " ($10^{m}4$) " and *substitute* " rock, awash,"]

Page 79.—*After* line 33 *insert* :—

[**Page 84.**—Line 48 : *After* " **Dangers.**— " *insert* " **Beacons.**— "]

[**Page 85.**—Line 9 : *After* " entrance " *insert* " , marked on its western side by three small white beacons,"]

[**Page 86.**—Lines 44-45 : *Delete* " with " to " summit,"]

[**Page 90.**—Line 24 : *After* " **Light.**— " *insert* " **Beacon.**— "]
[Line 36 : *Add* :—A church tower nearly 2 cables south-eastward of the root of the wharf at Puerto Princessa is conspicuous.]
[*After* line 39 : *insert* :—
A pole beacon surmounted by a white triangle, 25 feet (7^{m}6) high, stands on the coastal bank westward of Bancaobancaon point.]

[**Page 91.**—Line 13 : *For* " **Buoys.**—" *read* " **Buoy.**—"]
[Lines 21-22 : *Delete* " A " to " shoal."]
[Lines 31-32 : *Delete* and *substitute* :—
The outer end of a sunken concrete landing, with a depth of 2 feet (0^{m}6) over it, lies about 2 cables north-eastward of the head of the wharf and about one cable offshore.]
[*After* line 37 *insert* :—
A mooring buoy is laid about 1½ cables north-north-westward of the head of the wharf.]

Page 92.—[Line 2 : *For* " 20 feet (6^{m}1) " *read* " 22 feet (6^{m}7) "]
[Line 3 : *For* " 1948 " *read* " 1952 "]
Lines 6-7 : *Delete.*

[**Page 99.**—Lines 26-27 : *Delete* " A tree " to " landmark."]

Page 100.—Line 35 : *Delete* " (Kanabungan) "

Page 101.—Line 25 : *Delete* " (Balábak) "
Lines 27, 52 : *Delete* " (Kandaraman) "
Line 32 : *Delete* " (Sekam) "

Page 102.—Line 9 : *Delete* " (Kaxisigan) "

Page 103.—Lines 9, 21 : *Delete* " (Balábak) "
Line 21 : *For* " 1,867 feet (569^{m}0) " *read* " 1,890 feet (576^{m}1) "

Page 104.—Line 3 : *After* " dwelling," *insert* " 33 feet (10^{m}1) in height,"

Page 105.—Line 28 : *Delete* " (Balábak) "
Line 32 : *Delete* " (West) "
Line 36 : *For* " 2¼ fathoms (4^{m}1) " *read* " 2¾ fathoms (5^{m}0) "
Line 42 : *For* " 3¾ fathoms (6^{m}9) " *read* " 2¾ fathoms (5^{m}0) "
Lines 45-47 : *Delete.*

Page 106.—Line 5 : *After* " dwelling," *insert* " 90 feet (27^{m}4) in height,"
Lines 37-38 : *Delete* " Three " to " patch."
Lines 45, 50 : *Delete* " (Komiran) "

Page 107.—Line 10 : *Delete* " (Komiran) "
Lines 12, 20 : *Delete* " (Lumbukan) "
Line 17 : *Delete* and *substitute* :—
" three 5¾-fathom (10^{m}5) patches lie between the above patches. Comiran channel is "

Page 107 continued.

Line 27 : *Delete* " 1¾ " to " $5^{m}5$) " and *substitute* " 1½ to 2½ fathoms ($2^{m}7$ to $4^{m}6$) "

Line 28 : *For* " 2¾ " *read* " 3 "

Line 29 : *Delete* " 3 " to " $9^{m}1$) " and *substitute* " 2½ to 4 fathoms ($4^{m}6$ to $7^{m}3$) "

Line 44 : *Delete* " (Balábak) "

Page 108.—[Lines 14-15 : *Delete* " the " to " chart,"]

[Line 17 : *After* " 1951 " *insert* " ; *see* Admiralty Notice to Mariners, No. 18 of the current year "]

Line 18 : *Delete* " (Lumbukan) "

Line 22 : *For* " 7½ fathoms ($13^{m}7$) " *read* " 8 fathoms ($14^{m}6$) "

Lines 22-23 : *Delete* " and " to " southward " and *substitute* "miles southward and 3½ miles south-south-westward, respectively,"

Lines 26-27 : *Delete.*

Page 109.—*After* line 9 *insert* :—

In 1950, a shoal, with a depth of 10 fathoms ($18^{m}3$), the position of which is approximate, was reported to lie about 23 miles east-south-eastward of the charted position of Borneo bank.

[Line 26 : *After* " trees " *insert* " ; in 1952, there was a conspicuous casuarina tree at the eastern end of the island "]

[**Page 118.**—Line 50 : *After* " steep-to " *insert* " , with two other reefs within one mile west-north-westward of it "]

[**Page 124.**—Lines 2-4 : *Delete.*]

[Line 8 : *After* " from a " *insert* " conspicuous "]

[Line 27 : *Add* :—A beacon stands on Datum rock.]

[**Page 125.**—Lines 25-26 : *Delete.*]

[**Page 127.**—Line 49 : *After* " **Beacon.**— " *insert* " **Buoyage.**— "]

[**Page 128.**—*After* line 15 *insert* :—

A 5-foot ($1^{m}5$) patch lies about 1¼ miles westward of Egeria rocks ; it is marked by a conical buoy painted in red and yellow vertical stripes.]

[Line 20 : *Add* :—A 4¾-fathom ($8^{m}7$) shoal lies about half a mile west-north-westward of Egeria rocks.]

Page 130.—[Line 13 : *For* " 108 feet ($32^{m}9$) " *read* " 10 feet ($3^{m}0$) "]

[Line 19 : *For* " 70 feet ($21^{m}3$) " *read* " 15 feet ($4^{m}6$) "]

After line 24 *insert* :—

In 1951, a shoal, with a depth of less than 12 feet ($3^{m}7$), was reported to lie about 2½ miles east-north-eastward of Bu a ning cay, and to extend about one mile in an east-north-easterly direction.

[**Page 131.**—Line 34 : *For* " **Light-buoy** " *read* " **Buoy.**— "]

[Lines 47-48 : *Delete* " about " to " grass " and *substitute* ", which covers at high water "]

[**Page 132.**—*After* line 8 *insert* :—

A 3½-fathom ($6^{m}4$) patch is situated very close north-eastward of the recommended track about 1½ miles west-south-westward of Sipindung with a 4¾-fathom ($8^{m}7$) patch about 3½ cables further south-westward.]

[Line 42 : *Add* :—A 4¾-fathom ($8^{m}7$) patch, situated northward of Sedgeman rock, lies about 1¼ cables south-westward of the recommended track.]

[Line 51 : *For* " 3¾ " *read* " 4¼ "]

[**Page 133.**—Lines 8-13 : *Delete* and *substitute* :—

A conical buoy, painted in red and white vertical stripes, moored about 8 cables south-westward of the recommended track and 3¾ miles north-eastward of Billean, marks the north-western side of two shoals, with depths of 2 and 3 fathoms ($3^{m}7$ and $5^{m}5$) over them, respectively ; a group of patches, with depths over them of from 3½ to 5¼ fathoms ($6^{m}4$ to $9^{m}6$), lies about half a mile eastward of the 2-fathom ($3^{m}7$) patch, and from 4 to 8 cables south-westward of the recommended track.]

[Line 16 : *After* " Billean " *insert* " with a 1¾-fathom ($3^{m}2$) patch about 2¼ miles westward of it "]

[Line 17 : *For* " 3 fathoms ($5^{m}5$) " *read* " 1½ fathoms ($2^{m}7$) "]

[Line 18 : *Delete* " another " to " 1¼ " and *substitute* " a 1¾-fathom ($3^{m}2$) patch about 1½ "]

[Lines 20-21 : *Delete* " 3 miles " to " Billean." and *substitute* " about 4¼ miles east-north-eastward of Sunbeam rock, with a 4½-fathom ($8^{m}2$) shoal about 1½ miles southward of it."]

[**Page 134.**—Line 14 : *After* " **dangers.—** " *insert* " **Light-buoy.—**"]

[Line 25 : *Add* :—There are many uncharted shoals in the area south-westward of a line between Billean and Lankayan ; they are difficult to see on account of the muddy water.]

[Line 26 : *Delete* and *substitute* :—

" A 3-fathom ($5^{m}5$) shoal lies about 3¼ miles north-westward "]

[Line 28 : *For* " 3 " *read* " 5 "]

[Line 30 : *After* " track " *insert* " , with least depths of 3½ and 3¾ fathoms ($6^{m}4$ and $6^{m}9$) over them,"]

[Line 34 : *After* " shoal " *insert* " , with a depth of 3 fathoms ($5^{m}5$) over it,"]

[*After* line 38 *insert* :—

A spherical light-buoy, painted in red and yellow horizontal bands and exhibiting a *white flashing* light *every five seconds*, is moored on the southern side of the 3-fathom ($5^{m}5$) shoal about 5 miles north-north-eastward of Lankayan.]

[Line 39 : *For* " 4¼ fathoms ($7^{m}8$) " *read* " 3 fathoms ($5^{m}5$) "]

[Line 45 : *For* " 2 fathoms ($3^{m}7$) " *read* " 1¼ fathoms ($3^{m}2$) "]

[Lines 53-54 : *Delete* and *substitute* :—

Shoals, some with depths of less than 6 feet ($1^{m}8$) over them, extend almost continuously south-westward for a distance of about 10 miles from Lankayan.]

[**Page 135.**—Lines 2-54 : *Delete* and *substitute* :—

Islands and dangers in approach to Labuk bay.—Sibaung, a small rocky islet, on which there are a few trees about 40 feet ($12^{m}2$) high,

Page 135 continued.

lies 13½ miles south-south-eastward of Lankayan. A coral reef surrounds the island, and depths of 7 feet ($2^{m}1$) exist 3 cables south-westward of it.

Glen shoal, a small coral patch with a depth of 5 fathoms ($9^{m}1$) over it, lies about 2 miles north-north-eastward of Sibaung.

Boaan, about 255 feet ($77^{m}7$) high to the tops of the trees, is the northernmost of a chain of islands which extends about 14 miles northward from Tanjong Pisau (Tg. Pandaras), the south-eastern entrance point of Labuk bay. Boaan is fringed by a coral reef, which extends about 2 cables from its north-western side. A depth of 2¾ fathoms ($5^{m}0$), lies about 4 cables westward of the western point of the island, and a small detached shoal, with a depth of 5¾ fathoms ($10^{m}5$) over it, lies about 4 cables south-westward of the point. The island is densely planted with coconut palms. *See* view facing page 134.

Powell shoal, a small coral patch with a depth of 4¼ fathoms ($7^{m}8$) over it, lies about 1½ miles north-eastward of Boaan.

Flying Fish rock, with a depth of 9 feet ($2^{m}7$) over it, and steep-to, lies about 2½ miles eastward of Boaan. Another shoal, with a depth of 2¼ fathoms ($4^{m}1$) over it, and steep-to, lies about one mile south-westward of Flying Fish rock.

Lihiman, an island about 220 feet ($67^{m}1$) high to the tops of the trees, lies about 2¾ miles southward of Boaan. The island is closely planted with coconut palms. It is fringed by a coral reef and shoal water which extends up to 3 cables from its north-western side; the south-western point of the island is steep-to. About 5 cables north-eastward of Lihiman is a small rocky islet with a few trees about 65 feet ($19^{m}8$) high; the islet is surrounded by a reef and shoal water for a distance of about 2 cables. *See* view facing page 134.

Both Lihiman and Boaan are mud volcanoes; the former was active in 1952 but the latter appears to have been extinct for many years.

Turtle rock, with a depth of 1¾ fathoms ($3^{m}2$) over it, is steep-to, and lies about 1¾ miles south-westward of Lihiman.

Langaan, a wooded islet, about 90 feet ($27^{m}4$) high to the tops of the trees, lies about 5 miles east-south-eastward of Lihiman. It is surrounded by an extensive coral reef which dries in patches; the reef extends to a distance of about 7 cables north-eastward and eastward of Langaan, and depths of less than one fathom ($1^{m}8$) are found up to 1¼ miles north-eastward of the island. There is a rocky islet, 5 feet ($1^{m}5$) high, about 4 cables eastward of Langaan.

Johnston rock, with a depth of 8 feet ($2^{m}4$) over it, lies about 2¼ miles north-eastward of Langaan; there is a small detached coral shoal, with a depth of 4¾ fathoms ($8^{m}7$) over it, about 1½ miles eastward of Johnston rock; 2¾ miles north-eastward of this there is a shoal with a depth of 7¼ fathoms ($13^{m}3$) over it.

Two coral patches, with depths of 3¼ and 3¾ fathoms ($5^{m}9$ and $6^{m}9$) over them, respectively, lie about 3¼ and 3 miles north-north-eastward of Langaan.

There are a number of other patches, with depths of from 6 to 10 fathoms ($11^{m}0$ to $18^{m}3$), in the area north-eastward of Langaan, the positions of which may best be seen on the chart.

A coral patch having a depth of 4¾ fathoms ($8^{m}7$) over it, lies about 4½ miles east-south-eastward of Langaan, and there is a patch with a depth of 8¾ fathoms ($16^{m}0$) over it, about 8 cables northward of this.

Page 135 continued.

Great Bakkungaan is an island situated about 2 miles south-westward of Langaan. It is closely planted with coconut palms about 145 feet ($44^{m}2$) high.

The channel between Great Bakkungaan and Langaan is choked with reefs and shoals, some of which have a depth of less than 6 feet ($1^{m}8$) over them ; no vessel should attempt to pass through it.

An extensive reef, which extends for about 1¼ miles in a north-easterly and south-westerly direction, and which dries in patches, is situated about half a mile north-westward of Great Bakkungaan.

Two shoals, with depths of 3 and 6 feet ($0^{m}9$ and $1^{m}8$) over them, respectively, lie about 1½ and 2 miles north-westward of Great Bakkungaan.

Little Bakkungaan, about 110 feet ($33^{m}5$) high to the tops of the trees, is situated about one mile south-south-westward of Great Bakkungaan ; the boundary between North Borneo and Phillipine territorial waters passes between Great and Little Bakkungaan islands.

A reef which dries 2 feet ($0^{m}6$), extends for about 2 cables northward and eastward of Little Bakkungaan, and a detached coral shoal, having a depth of 4 feet ($1^{m}2$) over it, lies about 4 cables south-eastward of the island. A shoal, with a depth of 7 fathoms ($12^{m}8$) over it, lies about 7 cables westward of the island.

Silingaan island, with trees about 100 feet ($30^{m}5$) high, lies about 3¼ miles west-south-westward of Great Bakkungaan. A reef which dries extends up to 2 cables westward, northward and eastward of the island.

Between Great Bakkungaan and Silingaan lies a chain of shoals and reefs.

A shoal, with a depth of 2¾ fathoms ($5^{m}0$) over it, lies about 4 cables north-westward of the south-westward point of Great Bakkungaan ; a reef which dries one foot ($0^{m}3$), lies about 7 cables west-south-westward of the island, and a shoal with depths of from 2¾ to 3½ fathoms ($5^{m}0$ to $6^{m}4$) over it, lies about 4 cables further south-westward. A shoal, with a depth of 1¾ fathoms ($3^{m}2$) over it, lies 1¾ miles west-south-westward of Great Bakkungaan.

Between the last-mentioned two shoals there is a channel about 4 cables wide through which a vessel may pass in a depth of not less than 7 fathoms ($12^{m}8$), by keeping the summit of Lihiman island bearing 339°.

An extensive reef, which dries 2 feet ($0^{m}6$), lies about 2¼ miles west-south-westward of Great Bakkungaan, and a shoal, with a depth of 2¾ fathoms ($5^{m}0$) over it, lies about 4 cables south-eastward of this reef.

A shoal, with a depth of 8 feet ($2^{m}4$) over it, lies about 7 cables westward of Shilingaan, and another with 2½ fathoms ($4^{m}6$) over it, lies about 5 cables north-westward of the island.]

[Page 136.—Lines 2-15 : *Delete* and *substitute* :—

Gulisaan, a small islet, with trees about 75 feet ($22^{m}9$) high, lies about 1½ miles south-south-westward of Silingaan. A reef, which extends up to 6 cables in an easterly and westerly direction and which dries as much as 4 feet ($1^{m}2$), fringes the island.

A channel about 9 cables wide at its narrowest point, and having

Page 136 continued.
a least depth of 22 feet ($6^{m}7$) in the centre, lies between the reefs fringing Gulisaan and Silingaan.

Libarran, the largest island in the group and densely wooded, the tops of the trees being about 100 feet ($30^{m}4$) high, lies about 3¼ miles north-eastward of Tanjong Pisau. From the island a coral reef extends 1¼ miles eastward, with Black rock, an islet about 75 feet ($22^{m}9$) high to the tops of the trees, near its outer end, and White rock, 6 feet ($1^{m}8$) high, 3½ cables west-south-westward of Black rock. The reef also extends westward from Libarran for about 6½ cables, with Pulau Bonting (Round islet), 59 feet ($18^{m}0$) high, or 95 feet ($29^{m}0$) to the tops of the trees, close to its western extremity. About 2¼ cables north-westward of Pulau Bonting, is a rock which dries 2 feet ($0^{m}6$), and 4 cables north-eastward is Tree rock, 20 feet ($6^{m}1$) high. A small island, with trees about 75 feet ($22^{m}9$) high, lies about 1½ cables northward of Libarran.]

[Lines 33, 51 : *For* " Pandaras " *read* " Pisau "]

[Line 34 : *After* " places." *insert* :—The kampong and the best landing place are at the southern end of the island.]

[Lines 38-39 : *For* " 4¼ fathoms ($7^{m}8$) " *read* " 4½ fathoms ($8^{m}2$) "]

[Lines 40-44 : *Delete* and *substitute* :—

Gubbins rock, with a depth of 7 feet ($2^{m}1$) over it, is steep-to and lies about 7 miles west-south-westward of Taganak. Another rock, with a depth of 2¼ fathoms ($4^{m}1$) over it, lies 3 cables southward of Gubbins rock.

About 2¼ miles south-westward of Gubbins rock and in the northern approach to Sandakan harbour, there is a coral patch with a depth of 9 feet ($2^{m}7$) over it ; it is steep-to.]

[**Page 137.**—Lines 13, 18, 23, 31, 45, 48 : *For* " Pandaras " *read* " Pisau "]

[Line 17 : *For* " 234 feet ($71^{m}3$) " *read* " 185 feet ($56^{m}4$) "]

[Line 42 : *For* " Round islet " *read* " Pulau Bonting "]

[**Page 138.**—Line 2 : *For* " Pandaras " *read* " Pisau "]

[Line 14 : *Delete* " precipice " to " streaks " and *substitute* " sandstone cliffs, the northernmost of which has two conspicuous white streaks "]

[*After* line 17 *insert* :—

Light.—A light is exhibited, at an elevation of 635 feet ($193^{m}5$), from a steel framework tower, 65 feet ($19^{m}8$) in height, situated near the summit of Berhala.]

[Line 27 : *For* " buoy " *read* " light-buoy "]

[Lines 29-36 : *Delete* " for a " to " 5 cables " and *substitute* " for the Bar light-buoy, situated about 8 miles north-eastward of the southern extremity of Berhala ; thence for the southern extremity of Berhala, bearing 218°, which, in 1952, lead over the flats in the approach to Sandakan in a depth of not less than 23 feet ($7^{m}0$). Having crossed the bar, when depths of more than 6 fathoms ($11^{m}0$) are obtained, alter course slightly southward and steer to pass 5 cables "]

[*After* line 45 *insert* :—

Although the more shallow reefs and shoals are often indicated by the light green colour of the water over them, by calm patches

Page 138 continued.

when there is a breeze blowing, or by tidal stream eddies on the surface, too much reliance should not be placed upon seeing them as the darker coral is often very hard to distinguish and surface light reflection may hide them completely. Polaroid glasses, which reduce reflection, are an invaluable aid. In, and for some distance to seaward of, the large shallow bays, the water is often opaque, in which case shoals are frequently invisible, while patches of sand in suspension give a most convincing impression of shallow water. This latter effect may be experienced anywhere in these waters when there is an appreciable tidal stream, or any sea running.]

[Lines 50-51 : *Delete* " , but " to " away "]

[**Page 139.**—*After* line 19 *insert* :—

Berhala, described on page 138, marks the north-western side of the entrance to the harbour and is conspicuous from seaward. The channel between Berhala and the mainland, through which the tidal stream sets strongly, is navigable, in its northern half, only by light draught vessels with local knowledge.]

[Lines 26-29 : *Delete* " The gaol " to " of it." and *substitute* :—The dome of the mosque situated about 8 cables west-south-westward of Tanjong Papat, and a black chimney, 140 feet ($42^{m}7$) high, situated nearly one mile further west-south-westward, are conspicuous.]

[Lines 32-34 : *Delete* and *substitute* :—]

" **Bar.—Light-buoy.—[Danger.**—A bar, composed of soft mud, about 5 miles wide between the 6-fathom ($11^{m}0$) lines, with, in 1952, an available depth of 23 feet ($7^{m}0$), lies from about 4½ to 9½ miles "]

After line 36 *insert* :—

" Bar " conical light-buoy, painted in red and white chequers and exhibiting a *white flashing* light *every five seconds*, is moored about 8 miles north-eastward of the southern point of Berhala.

[A 2-fathom ($3^{m}7$) patch lies on the western side of the approach to the harbour, about 2½ miles north-north-eastward of the southern end of Berhala.]

Line 38 : *For* " **Light-buoy** " *read* " **Buoyage** "

[Line 39 : *Delete* " 2½ " to " side " and *substitute* " 14 feet ($4^{m}3$) over it, and marked "]

After line 46 *insert* :—

A conical buoy, painted in black and white vertical stripes with a white can topmark, moored about 1¼ miles south-westward of the Government wharf, marks Allard bank. This buoy also marks the timber anchorage, and vessels should anchor close eastward, or north-eastward, of the buoy.

[Lines 49-50 : *Delete* " tripod " to " high " and *substitute* " concrete beacon, about 15 feet ($4^{m}6$) high, stands on a rock which dries 7 feet ($2^{m}1$) "]

[**Page 140.**—Lines 4-12 : *Delete* and *substitute* :—

Chart 950.

Anchorage.—Vessels can anchor anywhere southward of Atjeh rock, in depths of from 7 to 9 fathoms ($12^{m}8$ to $16^{m}5$), mud ; the holding ground is good, but it is advisable to lie to a long scope of cable on account of strong tidal streams and the possibility of sudden

Page 140 continued.

squalls. A large number of small craft are usually anchored within the 5-fathom (9^{m}1) line westward of the town.]

[Lines 15-17 : *Delete* " Between " to " &c." and *substitute* :—It is the headquarters of the Resident. Completely destroyed in the war, temporary structures were being replaced, in 1952, by permanent buildings.]

[Line 18 : *After* " hospital " *insert* " , with a ward "]

[Line 28 : *Delete* and *substitute* :—

In 1951, the population was 14,499.]

[Lines 30-39 : *Delete* " 1939 " to " water." and *substitute* " 1952, of 16 feet (4^{m}9). Small vessels can berth alongside the inner side of the eastern arm, in depths of from 6 to 11 feet (1^{m}8 to 3^{m}4) ; the landing place is here. In 1952, the wharf was in a bad state of repair.

Tidal streams.—Tidal and berthing signals.—In Sandakan harbour the tidal streams turn at the time of high and low water, the out-going stream attaining a maximum rate of 2 knots, and the in-going stream 1¼ knots. Alongside the government wharf the stream does not always turn at the same time as that in the harbour. A signal, consisting of a cone or a ball, is displayed from a mast on the roof of the Customs and Marine office, near the wharf to indicate the direction of the stream at the wharf ; a cone point up indicates an out-going stream ; a cone point down signifies in-going stream ; a ball indicates slack water.

A numerical signal displayed below the tidal stream signal indicates the berth at the wharf to be occupied ; No. 1 indicates the berth inside the eastern arm ; No. 2 indicates the berth outside the eastern arm, and No. 3 indicates the western berth."]

[Line 40 : *After* " **Trade.**— " *insert* :—Sandakan is the main trans-shipment port for the East coast, and is the centre of the timber industry of the Colony.]

[Lines 41-42 : *Delete* " hemp " to " sago " and *substitute* " timber, cutch, firewood "]

[Line 52 : *Add* :—Regular air services are maintained between Sandakan and Hong Kong, Manila and Singapore.]

[**Page 143.**—*After* line 23 *insert* :—

Benrinnes reef, with a depth of 4½ fathoms (8^{m}2) over it, lies about 14½ miles north-north-eastward of Driftwood point.]

Page 144.—*After* line 37 *insert* :—

A shoal, with a depth of 10½ fathoms (19^{m}2), was reported, in 1951, to lie about 9 miles south-eastward of the 5-fathom (9^{m}1) patch on Talantam bank.

[**Page 146.**—*After* line 25 *insert* :—

Light.—The light on Tanjong Labian is described on page 153.]

[Line 50 : *For* " 94 feet (28^{m}7) " *read* " 89 feet (27^{m}1) "]

[Line 51 : *After* " tower," *insert* " 84 feet (25^{m}6) in height,"]

Page 148.—Line 38 : *For* " 18 feet (5^{m}5) " *read* " 16 feet (4^{m}9) "

[**Page 153.**—Line 5: *After* "**BAY.**—" *insert* "**Light.—Beacons.**—"]

[*After* line 26 *insert*:—

A light is exhibited, at an elevation of 85 feet ($25^{m}9$), from a white steel framework tower on Tanjong Labian.]

[**Page 154.**—*After* line 5 *insert*:—

Bakapit is situated on a point about 4¼ miles west-north-westward of Bagahak point; there is a pier on the eastern side of the point and another pier at its southern end. Of the many dangers in the approaches to Bakapit, three reefs, situated about half a mile south-south-eastward, 4½ cables southward and one mile south-westward of the point were marked by beacons, in 1953.]

[Lines 22-25: *Delete* and *substitute*:—

Kinabalu shoal, with a least depth of 16 feet ($4^{m}9$) over it, rock and coral, lies about 3¼ miles east-south-eastward of Shoal point, the south-eastern extremity of Darvel peninsula.]

[Lines 26-27: *Delete* "9" to "3¾" and *substitute* "7 fathoms ($12^{m}8$) over it, lies nearly 4"]

[Line 28: *Add*:—A patch, with a least depth of 5¾ fathoms ($10^{m}5$) over it, lies about 6½ cables west-north-westward of Turner shoal, and about 1¼ miles offshore.]

[**Page 156.**—Lines 31-34: *Delete* "The" to "No. 10." and *substitute*:—Gray reef is marked by two beacons.]

Page 164.—*After* line 46 *insert*:—

Caution.—[A number of coral pinnacles, the positions of which are doubtful, are charted] in the south-western corner of Darvel bay. Mariners are warned to exercise great caution in the area southward of Lat. 4° 50′ N. and westward of Long. 118° 26′ E.

[**Page 171.**—Line 7: *After* "**Dangers.**—" *insert* "**Light.**—"]

[*After* line 41 *insert*:—

A light is exhibited, at an elevation of 350 feet ($107^{m}0$), from a white steel framework tower, 35 feet ($10^{m}7$) in height, situated on Si Amil island.]

[**Page 174.**—Line 25: *Add*:—In 1952, the southern of the two beacons on the coral patch was missing.]

[Line 28: *Add*:—Anchorage in good holding ground may be found about 2 cables off the pier.]

[**Page 175.**—Line 16: *Delete* ", marked" to "beacons,"]

Page 181.—Lines 9-10: *Delete* "are" to "end." and *substitute* "is a flagstaff at the inner end of the pier."

Lines 21-22: *Delete* ", with" to "outer flagstaff"

Page 183.—Line 27: *After* "**Dangers.**—" *insert* "**Beacon.—Buoy.**—"

After line 34 *insert*:—

Charts 306, 2099.

A wooden beacon, 15 feet ($4^{m}6$) in height, with a white rectangular topmark, stands on Adolphy point.

Page 183 continued.

After line 39 *insert* :—

A conical buoy, painted in red and white vertical stripes, is moored off the extremity of Pilot bank, 4 miles east-north-eastward of Adolphy Point beacon.

Chart 306.

Page 184.—Lines 17-18 : *Delete* " point " to " 262° " and *substitute* " Point beacon bears 260° "

Lines 20-24 : *Delete* and *substitute* :—

" When Agas point bears 230° she should steer for it on that bearing and, when Adolphy Point beacon is abeam, the vessel "

Page 189.—Line 32 : *After* " tower," *insert* " 57 feet (17^{m}4) in height,"

Page 197.—Line 16 : *Delete.*

[**Page 200.**—Lines 35-37 : *Delete* " 14 " to " craft." and *substitute* " 21 feet (6^{m}4) at its head."]

[**Page 201.**—Line 50 : *For* " **Beacons.—** " *read* " **Beacons.—Buoys.—** "]

[**Page 202.**—Line 4 : *Add* :—A beacon marks the eastern edge of the reef surrounding Sangasiapu islet.]

[Line 11 : *After* " high " *insert* " ; a conical buoy, painted in red and black horizontal bands, marks the western side of the 3-fathom (5^{m}5) shoal and a beacon stands on the sand cay "]

[*After* line 14 *insert* :—

Sangasiapu channel, straight and deep, lies about midway between Sangasiapu islet and Laa island. The southern entrance, situated about one mile south-eastward of Sangasiapu islet, is marked on each side by a buoy, and a pair of leading beacons on Simunul island, in line bearing 205°, lead through the channel.]

Page 211.—[Line 50 : *After* " **Siasi.—** " *insert* " **Light.—** "]

Lines 52-53 : *For* " 1937, of 20 feet (6^{m}1) " *read* " 1951, of 15 feet (4^{m}6) "

[*After* line 54 *insert* :—

A light is exhibited from a mast, 17 feet (5^{m}2) in height, at the root of the wharf.]

Page 219.—[*After* line 9 *insert* :—

There is a fish trap about a quarter of a mile north-eastward of Belan point.]

[Line 13 : *For* " **Light.—** " *read* " **Lights.—** "]

Line 22 : *Delete* " 1948 " to " (8^{m}2) " and *substitute* " 1951, there was a depth of 23 feet (7^{m}0) at the north-eastern end, 25 feet (7^{m}6) at the middle, and 30 feet (9^{m}1) at the south-western end "

[Line 24 : *After* " south-westward." *insert* :—It was reported, in 1953, that that part of the shore bank, with depths of less than 3 fathoms (5^{m}5), situated about 1½ cables north-eastward of the head of the mole, extends considerably farther offshore than charted.]

Page 219 continued.

[Line 25 : *Add* :—If previous notice is given a Customs launch will assist a vessel to berth or unberth.]

Line 27 : *Delete* " head of the "

[*After* line 28 *insert* :—

A light is exhibited from a mast on the top of a water tower situated about 1½ cables eastward of the root of the mole.]

Line 29 : *Delete* " **Radio station.**— "

Line 32 : *Delete.*

[*After* line 34 *insert* :—

There is a hospital ; medical facilities are limited.]

Page 226.—Line 25 : *After* " structure," *insert* " 52 feet ($15^{m}8$) in height,"

[**Page 229.**—Line 35 : *Add* :—There is a wooden pier, with a depth of 11 feet ($3^{m}4$) at its head, about 6 cables eastward of Mangal point.]

[**Page 230.**—Line 2 : *Delete* " **Light.**— "]

[Line 10 : *Delete.*]

[Line 29 : *For* " light-structure " *read* " wharf "]

[*After* line 42 *insert* :—

A **T**-headed pier, with depths of from 13 to 17 feet ($4^{m}0$ to $5^{m}2$) alongside its head, is situated on the coast about 4 miles north-westward of Port Holland.]

[**Page 233.**—Line 21 : *After* " **Anchorages.**— " *insert* " **Beacons.—Buoys.**— "]

[Lines 30-31 : *Delete* " Vessels " to " road."]

[*After* line 37 *insert* :—

A pair of white triangular beacons, in line bearing 069½°, lead through the channel northward of Moro island ; both channels are well marked by beacons and buoys, but the northern channel has a sharp turn in it.]

Page 234.—[Line 7-8 : *Delete* and *substitute* :—

" situated about three-quarters of a mile east-south-eastward of Moro island ; it is **U**-shaped, 600 feet ($182^{m}9$) long, with a depth of 30 feet ($9^{m}1$) at its western end, and of 27 feet ($8^{m}2$) at its eastern end ; a tall chimney stands close southward of this wharf. The middle wharf is **T**-shaped, 210 "]

Line 10 : *For* " 400 feet ($121^{m}9$) " *read* " 250 feet ($76^{m}2$) "

[Line 30 : *After* " bay " *insert* " ; good anchorage, in a depth of 10 fathoms ($18^{m}3$), may be obtained about a quarter of a mile off the pier."]

[*After* line 49 *insert* :—

A **T**-shaped pier, with a depth of 29 feet ($8^{m}8$) alongside its head, is situated on Tumajubun point, about 6 miles eastward of Mangal point.]

Page 239.—Line 40 : *After* " **Zamboanga.**— " *insert* " **Light.**— "

[Line 46 : *Delete* " 1948 " to " ($8^{m}2$) " and *substitute* " 1953, of 25 feet ($7^{m}6$) "]

Page 239 continued.

[Line 47 : *For* " 17 feet ($5^{m}2$) " *read* " 18 feet ($5^{m}5$) "]

After line 48 *insert* :—

A light is exhibited, at an elevation of 36 feet ($11^{m}0$), from a hut on iron supports, 29 feet ($8^{m}8$) in height, on the head of the wharf.

Page 240.—[*After* line 36 *insert* :—

Pilotage.—Pilotage is compulsory when berthing at the wharf; a vessel should anchor half a mile southward of the light-structure on the wharf to await a pilot.]

Lines 49-51 : *Delete.*

[**Page 243.**—Lines 36-37 : *Delete* " bushes " to " shores." and *substitute* " beaches."]

[Line 45 : *For* " 11 feet ($3^{m}4$) " *read* " 30 feet ($9^{m}1$) "]

[**Page 246.**—Line 7 : *For* " **Light.**— " *read* " **Lights.**— "]

[*After* line 16 *insert* :—

A light is exhibited, at an elevation of 39 feet ($11^{m}9$), from a wooden mast about 8 cables south-eastward of Botogan point.]

[**Page 258.**—*After* line 4 *insert* :—

Light.—**Beacons.**—The pocket in the reef mentioned above is well marked by privately maintained beacons.

A light, privately maintained, is exhibited from a mast, 42 feet ($12^{m}8$) in height, on the head of the pier at Suba Nipa, about one mile northward of Silagui islet.]

[Line 33 : *Delete* " **Beacons.**—**Buoy.**— "]

[Lines 51-53 : *Delete* " , and " to " high "]

[**Page 259.**—Lines 6-11 : *Delete.*]

[**Page 260.**—Lines 13-15 : *Delete* " It is " to " daymark."]

[**Page 261.**—Lines 26-27 : *Delete* and *substitute* :—

" is in ruins."]

[Line 48 : *Delete* " **Directions.**— "]

[Line 54 : *Delete.*]

[**Page 262.**—Lines 1-13 : *Delete.*]

[**Page 265.**—Line 9 : *After* " **bay.**— " *insert* " **Light.**— "]

[*After* line 32 *insert* :—

A light is exhibited from a mast, 12 feet ($3^{m}7$) in height, on the head of the larger pier.]

[**Page 270.**—Line 45 : *After* " **Anchorages.**—" *insert* " **Light.**— "]

[**Page 271.**—Lines 2-3: *For* " small stone mole " *read* " wharf, with a depth of 16 feet ($4^{m}9$) at its head,"]

[*After* line 3 *insert* :—

A light, privately maintained, is exhibited from a mast, 32 feet ($9^{m}8$) in height, on the wharf at Pagadian.]

[Lines 13-14 : *Delete* " with " to " 355°, "]

[**Page 273.**—*After* line 45 *insert* :—
The edge of the shore bank within 1½ cables southward of the pier is marked by four groups of piles.]

Page 275.—Lines 30-31 : *Delete.*

Page 279.—Lines 35-37 : *Delete.*

[**Page 281.**—Line 43 : *After* " **Coast.**— " *insert* " **Beacons.**— "]

[**Page 282.**—Line 5 : *Add* :—Two pole beacons, each 10 feet ($3^{m}0$) in height and surmounted by a white triangle, stand near the coast about 3 and 5 miles north-westward of Pagang point.]
[Line 14 : *Add* :—There is a pier, with a depth of 5 feet ($1^{m}5$) at its head, about one mile eastward of Bacud point.]
[Line 19 : *After* " **Dangers.**— " *insert* " **Beacon.**— "
[Line 33 : *After* " southward." *insert* :—There is a pole beacon, 10 feet ($3^{m}0$) in height, surmounted by a white triangle, near Pananag.]

Page 283.—Lines 23-25 : *Delete* " with " to " lie." and *substitute* " which, in 1951, was reported to be in ruins, the outer portion having been destroyed."

[**Page 285.**—Line 19 : *Delete* " **Light.**— "]
[Lines 36-37 : *Delete.*]

Page 287.—Line 14 : *Delete.*

[**Page 290.**—Line 54 : *Add* :—There is a **T**-headed pier on the southern shore.]

Page 292.—Lines 12-13 : *Delete* " with " to " head." and *substitute* " which, in 1951, was reported to be partially destroyed."
Lines 34-35 : *Delete.*
[*After* line 51 *insert* :—
Light.—A light is exhibited, at an elevation of 37 feet ($11^{m}3$), from a concrete tower at Santa Ana.]
[Line 52 : *After* " **Pier.**— " *insert* " **Mooring buoys.**— "]
Line 54 : *Add* :—In 1950, it was reported that this pier was unusable, owing to insufficient depth of water alongside. [There are a number of mooring buoys in the vicinity of the pier.]

Page 293.—Line 8 : *After* " importance," *insert* " is the capital of Davao province, and "
Line 13 : *Delete* " **Radio station.**— "
Line 17 : *Delete.*
After line 21 *insert* :—
Pilotage.—Pilotage into Davao is compulsory. The pilot boards vessels between Talicud island and Davao. Pilotage outward from Davao is compulsory. Pilotage through Pakiputan strait is compulsory.
Pilotage to and from Government owned piers is compulsory, but pilotage to and from private piers is optional.

Page 293 continued.

Pilotage for anchoring or leaving an anchorage, or shifting or changing berth, in the stream of the harbour at Davao, is compulsory for vessels engaged in the foreign trade.

[Line 38: *After* " point " *insert* " ; a shoal, with a depth of 4½ fathoms (8^{m}2) over it, lies about three-quarters of a mile south-south-eastward, and a rock, with a depth of 4 feet (1^{m}2) over it, lies about 6 cables eastward, of Pohun point; sunken rocks and shoal patches lie as much as 3½ cables offshore at the head of the bay "]

[Line 39: *Add* :—There is a stone pier, the outer end of which dries, at the village.]

Page 294.—[Line 10: *Add* :—On the western shore, a hut situated about 2¾ miles, and a school about 5¼ miles, northward of Linao point are prominent marks.]

[Line 12: *For* " 5-fathom (9^{m}1) " *read* " 4¼-fathom (7^{m}8) "]

[Line 14: *For* " 13 feet (4^{m}0) " *read* " 9 feet (2^{m}7) "]

[Lines 34-35: *Delete* " A " to " 2¼ " and *substitute* :—

" A 5-fathom (9^{m}1) patch lies nearly in midchannel about 5 cables north-eastward of Lanang point and about 4 cables off the western shore.

The southern end of a detached reef, with depths of 2 and 3 feet (0^{m}6 and 0^{m}9) over it, lies about 2½ "]

After line 37 *insert* :—

[Piers].—At Lanang point there is a **U**-shaped Government concrete pier, 500 feet (152^{m}4) long at the face, and with a depth of [24] feet [(7^{m}3)], in [1950].

[There is a privately owned pier nearly one cable southward of Lanang point; in 1952, there was a depth of 33 feet (10^{m}1) off its outer end.]

Line 51: *After* " alignment " *insert* " , taking care to avoid the 5-fathom (9^{m}1) patch about 5 cables north-eastward of Lanang point,"

Line 52: *For* " 196° " *read* " about 199°"

Page 296.—[Line 28: *After* " inside " *insert* " ; there is a wooden pier here on the southern side of the entrance "]

[Line 30: *Add* :—There is a wooden pier about one mile eastward of the mouth of Hijo river.]

Line 35: *Add* :—In 1951, it was reported that this mole had been destroyed.

Maco, a settlement at the head of Davao gulf, has a prominent saw-mill shed, built of corrugated iron, and a short pier.

[**Page 302.**—Line 36: *Add* :—There is a wooden pier, with a depth of 7 feet (2^{m}1) at its head, on the mainland about half a mile southward of Pandasan island.]

[**Page 305.**—Line 17: *For* " **Light.**— " *read* " **Lights.—Buoy.**— "]

[Line 24: *Add* :—*Red* and *green* obstruction lights, privately maintained, are exhibited from twin white chimneys situated about 2 miles east-south-eastward of the entrance to Liang river.]

[Lines 27-28: *Delete* " There " to " alongside."]

[Line 38: *After* " point " *insert* " ; it is marked on its eastern side by a black can buoy "]

[**Page 307.**—Line 3: *Delete* " , and " to " church "]
[Line 6: *For* " church " *read* " town "]
[Line 9: *For* " church bearing " *read* " town bearing about "]
[Lines 23-24: *Delete* " A pier " to " 1938." and *substitute*:—There is a pier with a depth of 16 feet ($4^{m}9$) at its head.]

[**Page 308.**—Line 14: *After* " reef " *insert* " ; there is a small wooden jetty here, of flimsy construction, where ore is loaded into lighters during the South-west monsoon for shipment in the bay; anchorage is about 4 cables offshore in a depth of 8 fathoms ($14^{m}6$) "]

Page 311.—[Line 33: *After* " **Anchorages.**— " *insert*:— " **Lights.**— "]
[*After* line 46 *insert*:—
A **T**-headed pier, with a face 540 feet ($164^{m}6$) in length and with depths alongside of from 25 to 28 feet ($7^{m}6$ to $8^{m}5$), is situated at Santa Rita about one mile north-westward of the pier at Santa Clara.

Two privately maintained lights, horizontally disposed, are exhibited from the middle of the head of the pier at Santa Rita.

In 1953, a pier, about 1,000 feet ($304^{m}8$) long, for loading and discharging oil was under construction about 4 cables north-westward of the pier at Santa Rita.]

Lines 51-[54]: *Delete* " 1938 " to " [pier.] " and *substitute* " [1954, depths alongside its south-eastern side of from 18 feet ($5^{m}5$) at its head to 5 feet ($1^{m}5$) about 330 feet ($100^{m}8$) inshore, and alongside its north-western side of from 17 feet ($5^{m}2$) at its head to 2 feet ($0^{m}6$) about 260 feet ($79^{m}5$) from the head. The piles of the old pier head, extending about 400 feet ($121^{m}9$) southward from a position about 65 feet ($19^{m}8$) outside the present head of the pier, were cut off about 3 feet ($0^{m}9$) above the sea bed, when that head was removed.]

Page 312.—Line 8: *Delete* " **Radio station.**— "
Line 10: *Delete.*

Page 315.—[*After* line 44 *insert*:—
San Teodoro, a township situated about 4½ miles south-eastward of Varadero point, and a hill, 650 feet ($198^{m}1$) high, about three-quarters of a mile south-eastward of the town, are reported to be prominent landmarks.

In the South-west monsoon anchorage may be found, in a depth of from 20 to 30 fathoms ($36^{m}6$ to $54^{m}9$), good holding ground, about half a mile offshore, with the 650-foot ($198^{m}1$) hill bearing 245° and the point about 3 miles north-westward bearing 304°.]

Line 50: *Delete* " 1938 " to " head " and *substitute* " 1951, of 14 feet ($4^{m}3$) at the northern end, and 11 feet ($3^{m}4$) at the middle and southern end "

[**Page 316.**—Line 16: *Delete* " **Light.**— "]
[Lines 26-27: *Delete.*]

Page 320.—Line 28: *Delete* " 33 " to " column " and *substitute* " 35 feet ($10^{m}7$), from a concrete column, 33 feet ($10^{m}1$) in height "

Page 320 continued.

[Lines 33-36 : *Delete* " about " to " sand." and *substitute* " in a depth of about 20 fathoms ($36^{m}6$), with Pinamalayan light-column bearing 270°, distant about three-quarters of a mile.

Off the village of Quinabigan (Kinabigan), about 3 miles southward of Pinamalayan, the anchorage recommended is in a depth of about 30 fathoms ($54^{m}9$), with Quinabigan bearing 235°, distant 11½ cables."]

Page 330.—Lines 18-19 : *Delete* " 1937 " to " alongside " and *substitute* " 1951, of from 11 to 14 feet ($3^{m}4$ to $4^{m}3$) at the outer end "

Page 331.—Line 3 : *Add* :—In 1951, the church tower was reported to be obscured by trees.

Page 334.—Line 13 : *After* " tower," *insert* " 97 feet ($29^{m}6$) in height,"

Page 335.—Line 43 : *Delete* " a depth " to " alongside." and *substitute* " depths alongside, in 1951, of 16 feet ($4^{m}9$) at the northern and middle parts, and 19 feet ($5^{m}8$) at the southern part, of the head of the pier. In 1952 this pier was reported to be in ruins."

[**Page 336.**—Lines 32-35 : *Delete* " compulsory " to " vessels." and *substitute* " compulsory. If previous notice is given a pilot will meet the vessel off Sinapsapan point about 1¼ miles northward of Naburul island, on the eastern side of the south-western entrance to Iloilo strait."]

Page 337.—Line 8 : *After* " tower," *insert* " 38 feet ($11^{m}6$) in height,"
[Line 10 : *Delete.*]
[Line 11 : *Delete* " (Igan) "]
[*After* line 15 *insert* :—
Chart 2391.]

Page 338.—[Line 30 : *For* " 2¼ " and " eastward " *read* " 1½ " and " north-westward "]
[Line 45 : *For* " 1935 " *read* " 1948 "]
[Line 46 : *Delete* " depths " to " $7^{m}3$) " and *substitute* :—
" a depth of 7½ feet ($2^{m}3$) "]
[Lines 48-49 : *Delete.*]
Line 52 : *Delete* " draught " to " $8^{m}5$) " and *substitute* " depth of 13 feet ($4^{m}0$) at the northern end, 20 feet ($6^{m}1$) at the middle and 30 feet ($9^{m}1$) at the southern end "

Page 340.—Line 38 : *After* " dwelling," *insert* " 62 feet ($18^{m}9$) in height,"
[Line 42 : *After* " **Lights.**— " *insert* " **Beacon.**— "]

[**Page 341.**—Line 8 : *After* " point " *insert* " ; its outer end is marked by a beacon "]

Page 341 continued.

[*After* line 30 *insert* :—

To berth, a vessel should drop her port anchor about 400 feet (121^{m}9) off the piers and secure, starboard side to, to lie about 10 feet (3^{m}0) off, with lines out to both piers, a line from the starboard bow to a tree on the eastern shore, and from the port quarter to a tree on the western shore.]

Page 344.—Lines 44-45 : *Delete.*

Page 350.—*After* line 23 *insert* :—

There is a concrete ferry pier about one cable in length, situated about 3 cables southward of Batan point.

Page 351.—Lines 42-43 : *Delete* " are " to " it " and *substitute* " is Libas village "

Line 49 : *After* " structure," *insert* " 16 feet (4^{m}9) in height,"

Lines 50-52 : *Delete* and *substitute* :—

A light is exhibited, at an elevation of 20 feet (6^{m}1), from a white square concrete tower, on the head of the southern breakwater at Libas cove.

Page 352.—*After* line 3 *insert* :—

There is a concrete marginal wharf at Capiz, with depths of from 7 to 14 feet (2^{m}1 to 4^{m}3) alongside.

Page 358.—Line 23 : *For* " 18 feet (5^{m}5) alongside " *read* " 23 feet (7^{m}0) at the outer end "

Line 26 : *For* " beacon " *read* " tower, 30 feet (9^{m}1) in height "

Page 360.—Line 51 : *After* " **Channels.**— " *insert* " **Buoy.**— "

Page 361.—*After* line 34 *insert* :—

Turia rock is marked on its north-western side by a can buoy, painted in black and red horizontal bands.

Line 45 : *For* " **Buoy.**— " *read* " **Buoys.**— "

Page 362.—Line 48 : *Add* :—The eastern extremity of this bank is marked by a red conical buoy, moored about 6 miles east-northeastward of Dumangas point. A red conical buoy, No. 4, marks the south-eastern extremity of the bank, at the entrance to Iloilo strait, about 2½ miles eastward of Dumangas point.

Page 363.—Line 2 : *After* " **Dangers.** — " *insert* " **Light-buoy.** — [**Lights.**—] "

[Line 24 : *After* " name " *insert* " ; a group of three chimneys, painted aluminium colour with black tops, situated about 1¾ miles southward of the river mouth, is conspicuous "]

Line 40 : *Add* :—The north-western extremity of the shoal is marked by a light-buoy, painted black, and exhibiting a *white flashing* light *every four seconds.*

[Line 52 : *Add* :—Two privately maintained mooring buoys are laid off Mambagid, the outer buoy lies about 1¼ miles offshore.]

[**Page 364.**—Line 4: *For* "white chimneys" *read* "chimneys painted aluminium colour with red, white and blue bands at the top, from each of which *red* obstruction lights are exhibited,"

[Line 8: *After* "island" *insert* "; a chimney, painted aluminium colour with a conspicuous black spark arrester at the top, stands about one mile inshore behind the town. Two *orange* obstruction lights are exhibited from the chimney"]

[Lines 8, 12: *For* "Nino" *read* "Niño"]

[Line 12: *After* "damaged." *insert*:—A fuelling berth, consisting of three dolphins and a pipe line from the shore, has been constructed nearly one mile offshore at Santo Niño; three mooring buoys have been laid in the vicinity of the northern dolphin. There is a T-headed pier, with a depth of 11 feet (3^{m}4) alongside its head, nearly one mile northward of Santo Niño.]

[Line 36: *For* "19 feet (5^{m}8)" and "1949" *read* "15 feet (4^{m}6)" and "1950"]

[*After* line 38 *insert*:—

During the South-west monsoon it is advisable not to secure alongside the pier, but to anchor off, either about half a mile westward of the pier, or slightly eastward of the middle of the channel with the summit of Nalunga island bearing 270°.]

[Lines 40-42: *Delete.*]

[Line 45: *For* "4½" *read* "2½"]

[Line 46: *For* "2¾ fathoms (5^{m}0)" *read* "3¼ fathoms (5^{m}9)"]

[Line 53: *Delete* ", and" to "conical buoy"]

[**Page 365.**—Lines 32-33: *Delete* "(Paman-kolan)"]

Page 367.—Line 13: *Delete* "2" to "northward" and *substitute* "6, situated about 1¼ miles north-north-eastward"

After line 25 *insert*:—

No. 4 red conical buoy, moored on the northern side of the entrance to Iloilo strait, was described on page 362.

Line 27: *After* "3," *insert* "at its north-eastern edge by a black can buoy, No. 1,"

Line 28: *For* "No. 2" *read* "No. 6"

After line 40 *insert*:—

A 2½-fathom (4^{m}6) shoal was reported, in 1952, to lie about 1½ miles south-eastward of Dumangas point.

Line 53: *For* "can" *read* "conical"

Page 368.—*After* line 3 *insert*:—

Shoals, with depths of 3 and 3¼ fathoms (5^{m}5 and 5^{m}9), lie about 9 and 6 cables, respectively, south-south-eastward of Siete Pecados lighthouse.

Line 36: *For* "can" *read* "conical"

Page 370.—[*After* line 6 *insert*:—

Castañas, about 3¼ miles south-westward of the mouth of Tayabas river and close eastward of Canda, may be distinguished by two warehouses on the beach and by three landing jetties. A reef, not visible in the muddy water, lies about half a cable offshore here. Anchorage is recommended about one mile offshore in a depth of about 11 fathoms (20^{m}1).]

Line 29: *Delete.*

Page 377.—*After* line 22 *insert* :—
A pier extends northward for about 200 feet ($61^{m}0$) from Bacood point, situated about 3¼ cables south-south-westward of Madumug islet. A drum buoy is moored about 100 feet ($30^{m}5$) eastward of the head of the pier to mark the edge of the reef.

A rock, with a depth of 3 feet ($0^{m}9$) over it, lies about 240 feet ($73^{m}2$) westward of the head of the pier.

A pier, with a depth of 11 feet ($3^{m}4$) at its head, exists about three-quarters of a cable south-south-eastward of Salvaria islet.

[**Page 378.**—*After* line 19 *insert* :—
A shoal, with a depth of 2½ fathoms ($4^{m}6$) over it, was reported, in 1952, to lie about 1¼ miles west-north-westward of Gasan light-structure.]

Page 379.—Line 45 : *After* " point " *insert* :—There is a wharf, which extends north-north-eastward for about 1,200 feet ($365^{m}8$) from a point on the southern shore, about half a mile southward of Tabignan point.

Page 381.—Lines 14-16 : *Delete* " with " to " with " and *substitute* " for "
Line 17 : *For* " same point " *read* " northern extremity of Salomague island "

[**Page 386.**—Lines 23-27 : *Delete.*]
[Lines 51-52 : *Delete* " A pier " to " shore." and *substitute* :—The pier was destroyed during the war.]
[Line 53 : *For* " pier " *read* " site of the pier "]

[**Page 387.**—*After* line 13 *insert* :—
A private hospital, with 12 beds in 1947, situated at the head of the bay, is available to seamen.]

Page 388.—Lines 33-34 : *Delete.*

[**Page 392.**—Line 34 : *Add* :—There is a pier at Magallanes, with depths of from 12 to 19 feet ($3^{m}7$ to $5^{m}8$) alongside in 1952,]

Page 393.—Line 54 : *Delete* and *substitute* :—
There are two piers at Bulan, one about 1½ cables northward, and the other about 1½ cables southward, of the light-structure.

Page 396.—*After* line 27 *insert* :—
An obstruction was reported, in 1951, in the northern channel, about 2½ cables southward of Argos Point light-structure.

Page 399.—Line 22 : *Add* :—In 1951, this pier was reported to have been destroyed.

Page 400.—Lines 10-11 : *Delete* " a depth " to " alongside " and *substitute* " depths of 32 feet ($9^{m}8$) off the northern end, 42 to 45 feet ($12^{m}8$ to $13^{m}7$) at the middle, and 48 feet ($14^{m}6$) off the southern end, in 1951 "

Page 400 continued.

[Line 12 : *Add* :—There is also an **L**-shaped wooden pier, about one cable south-eastward of the **T**-shaped pier, with depths of 20 feet (6^{m}1) off the northern end, 19 feet (5^{m}8) at the middle, and 18 feet (5^{m}5) off the southern end, in 1951.

Fresh water may be obtained at the **T**-shaped pier between 1900 and 0000 hours.]

Page 401.—*After* line 33 *insert* :—

There is a concrete pier at Cataingan, with a depth of 4 feet (1^{m}2) at the head.

Page 403.—Line 44 : *After* " **Coast.**— " *insert* " **Light.**— "

Page 404.—Line 19 : *Add* :—A light is exhibited from the head of this pier.

Page 406.—Line 45 : *After* " tower," *insert* " 37 feet (11^{m}3) in height,"

Page 409.—Line 35 : *For* " a quarter of a mile " *read* " one cable "

Page 414.—Line 53 : *Add* :—In 1951, the outer end of this pier was reported to have been destroyed.

Page 417.—*After* line 12 *insert* :—

The remains of a breakwater, with a depth of 4 feet (1^{m}2) over the rubble, lie about one cable southward of the head of the pier ; their northern end is marked by a red conical buoy, and the southern end by a black can buoy.

An obstruction, awash at low water, lies about 1¾ cables northward of the head of the pier.

Lines 16-17 : *Delete.*

[**Page 418.**—Line 22 : *After* " **Calbayog.**— " *insert* " **Light.**— "]

[*After* line 28 *insert* :—

A light is exhibited, at an elevation of 33 feet (10^{m}1), from a white concrete tower, 33 feet (10^{m}1) in height, at Calbayog.]

Page 434.—Lines 8-9 : *Delete* " nearly " to " tinguish " ; and *substitute* " with a depth of 4 feet (1^{m}2) over it ; "

[**Page 436.**—*After* line 30 *insert* :—

Chart 3824.

Pontevedra, a town situated about 10 miles southward of Pandan point, stands on the southern side of a river, the entrance to which is marked by a large tree and by a pole beacon from which, at night, three lights, vertically disposed, are exhibited. There is a pier inside the river where lighters are loaded.

Anchorage may be obtained, in a depth of 3½ fathoms (6^{m}4) about 3½ miles west-south-westward of the mouth of the river. Vessels of deeper draught anchor off Himigaran (chart 3809), described below.

Two privately maintained mooring buoys are laid about 6 cables and 2½ miles, respectively, offshore, north-westward and south-westward of Pontevedra.

Chart 3809.]

[**Page 437.**—Line 2: *After* "anchor," *insert* "using the port anchor,"]
[*After* line 3 *insert*:—
Two mooring buoys, privately maintained, are laid within one mile westward of the mouth of the river.]

[**Page 438.**—Line 50: *After* "parts" *insert* "; a white monument stands on the summit of a hill on the southern side of the islet"]

[**Page 441.**—Line 53: *After* "Negros," *insert* "with a population of about 27,000 in 1952,"]

Page 442.—Line 4: *For* "500 feet (152^{m}4)" *read* "415 feet (126^{m}5)"
Lines 5-7: *Delete* "1948" to [" obtained."] and *substitute* ["1952, it had depths of from 31 to 5½ feet (9^{m}4 to 1^{m}7) alongside its northern side and of from 24 to 3½ feet (7^{m}3 to 1^{m}1) along its southern side. Silting at the pier is reported to be at the rate of one foot (0^{m}3), annually. Provisions are obtainable in small quantities."]
[Line 8: *Add*:—There are three hospitals.]
Line 47: *After* "**dangers.—**" *insert* "**Buoy.—**"

Page 443.—Line 8: *After* "point." *insert*:—The western extremity of Carmen shoals is marked by a red conical buoy.
After line 15 *insert*:—
A light is exhibited from a wooden tower, 30 feet (9^{m}1) in height, on the eastern side of the river entrance.
[Line 30: *After* "marked by" *insert* "leading lights,"]

Page 445.—*After* line 37 *insert*:—
There are also two privately maintained piers on the northern side of Danao river.
[*After* line 43 *insert*:—
Vessels loading sugar from Danao River wharves usually anchor about 1½ miles off the river mouth, in a depth of about 8 fathoms (14^{m}6).]

Page 447.—Line 43: *For* "**Beacon[.—Light.—]**" *read* "**Beacons[.—Lights.—**"]
Line 51: *Add*:—A white concrete beacon, 10 feet (3^{m}0) in height, surmounted by a white cone, stands on this reef about 2 cables northward of the point.

Page 448.—Line 2: *After* "with the" *insert* "north-eastern"
[*After* line 3 *insert*:—
A light, privately maintained, is exhibited on a small pier inside the mouth of Loya river, about 1½ miles north-eastward of Sabil point.]

Page 450.—Line 25: *After* "tower," *insert* "55 feet (16^{m}8) in height,"
Line 43: *After* "(10^{m}1)." *insert*:—In 1952 the pier was reported to be in ruins.
[Line 44: *For* "a depth of 26 feet (7^{m}9)" *read* "a least depth of 19 feet (5^{m}8), in 1952,"]

Page 451.—[Line 33 : *Delete* " **Light.**— "]
[Lines 47-48 : *Delete* and *substitute* :—]
There is a wharf about one mile south-south-westward of Guihulngan ———————— which, in 1952, was reported to have a depth of 5 feet ($1^{m}5$) off the seaward end.

Page 452.—Line 10 : *For* " **Beacons** " *read* " **Light** "
Lines 15-18 : *Delete.*
After line 22 *insert* :—
A light is exhibited from the top of a mast, 15 feet ($4^{m}6$) in height, situated about 2 cables westward of the church.
Lines 23-24 : *Delete* " 1937 " to " head " and *substitute* " 1952, was reported to be in ruins."
Line 46 : *After* " reefs." *insert* :—In 1952, these beacons were reported to have been destroyed, but their concrete bases still remain, and dry about 4 feet ($1^{m}2$).

Page 453.—*After* line 13 *insert* :—
There is a stone mole, privately maintained, about one cable southward of Balamban light-structure.
Line 22 : *After* " **Dangers.**— " *insert* " **Light.**— "
Line 29 : *After* "head." *insert* :—A light is exhibited from a wooden tower, 25 feet ($7^{m}6$) in height, at the root of the pier.

Page 454.—Lines 40-41 : *Delete* " small " to " head." and *substitute* " rock, awash at low water, on the southern side of the northern mole."

Page 455.—Line 31 : *After* " head." *insert* :—
In 1952, this pier was reported to be in ruins.
Line 54 : *Add* :—In 1952, this mole was reported to be in ruins.

Page 458.—Line 27 : *After* " head." *insert* :—In 1952, this pier was reported to be partly in ruins.
Line 33 : *Add* :—In 1952, No. 1 beacon was reported to be missing.
[Lines 39, 44 : *After* " buoy." *insert* :—This buoy was missing in 1952.]
[Line 50 : *Delete* and *substitute* :—
" A pier with a **T**-head, 226 feet ($68^{m}9$) in length and with, in 1952, a least depth of 26 feet ($7^{m}9$) alongside,"]
[Line 53 : *Add* :—There are three aluminium coloured tanks on the pier about one cable from its head. There are two warping buoys off each end of the head of the pier.]

[**Page 459.**—Line 37 : *For* " **Light.**— " *read* " **Lights.**— "]
[Line 47 : *For* " 17 feet ($5^{m}2$) " *read* " 12 feet ($3^{m}7$), in 1952,"]
[Line 49 : *For* " A light is " *read* " Two lights, vertically disposed, for the use of aircraft, are "]

Page 460.—[Lines 15-16 : *Delete* " , but " to " structure "]
[Line 17 : *For* " optional " *read* " compulsory "]

Page 460 continued.

[Line 18: *Delete* "No" to "entrance." and *substitute*:—If previous notice is given a pilot will meet the vessel at the southern entrance, where, if necessary, she should await his arrival. Pilotage is compulsory when berthing at any wharf or pier at Cebu or Opon.]

Lines 24-25: *Delete* "There" to "point."

[**Page 461.**—*After* line 52 *insert*:—

A light is exhibited, at an elevation of 72 feet ($21^{m}9$), from the western tower of San Nicholas church, situated about 9 cables westward of Fort San Pedro light-structure.]

[*After* line 53 *insert*:—

Three *red* obstruction lights, vertically disposed, are exhibited from a radio mast, painted in orange and white horizontal bands, situated about 1½ miles westward of San Nicholas church.]

Page 462.—[Line 8: *Add*:—It is covered by the *red* sector of San Nicholas Church light, between the bearings of 332° and 002°.]

[Line 9: *For* "34 feet ($10^{m}4$)" *read* "53 feet ($16^{m}2$)"]

Line 10: *After* "dwelling," *insert* "34 feet ($10^{m}4$) in height,"

[Lines 24-25: *Delete* "on" to "side"]

[*After* line 33 *insert*:—

The dangers mentioned above are covered by the *red* sector of San Nicholas Church light, between the bearings of 009° and 039°.]

[Line 39: *For* "2 fathoms ($3^{m}7$)" *read* "1¼ fathoms ($2^{m}3$)"]

[**Page 463.**—Line 20: *For* "the southern entrance" *read* "both entrance channels and in"]

[Lines 49-51: *Delete* "point." to "requisite." and *substitute* "point, and over an obstruction nearly 2¼ miles southward of the Capitol. When Fort San Pedro tower bears 050° she should alter course north-eastward to avoid the obstruction and anchor as requisite clear of the fairway. At night, the light on San Nicholas church bearing 004°, in the *white* sector between the bearings of 002° and 009°, leads through the southern entrance channel; when Fort San Pedro light bears 058° a vessel may steer for it on that bearing and anchor as convenient."]

[**Page 464.**—Line 29: *Delete* "the greater"]

[**Page 465.**—Line 51: *After* "draught." *insert*:—There is a submerged pipe line and several mooring buoys off the wharf.]

Page 469.—*After* line 10 *insert*:—

There is a pier, 465 feet ($141^{m}7$) long, with a depth of 14 feet ($4^{m}3$) at the outer end, situated about the middle of the western side of Basiao channel.

[**Page 470.**—Line 36: *Add*:—A stone mole, with a depth of 8 feet ($2^{m}4$) at its head, extends northward from the coast at Jetafe (Hetafe) close eastward of Corte point.]

[**Page 471.**—Line 18: *For* "13 feet ($4^{m}0$)" *read* "6 feet ($1^{m}8$)"]

Page 473.—[Line 4 : *After* " **Dangers.**— " *insert* " **Light.**— "]
[Line 14 : *After* " mole " *insert* " , with a depth of 4 feet ($1^{m}2$) at its head,"]
[*After* line 21 *insert* :—
A light is exhibited from a mast, 30 feet ($9^{m}1$) in height, at the head of the mole.]
After line 37 *insert* :—
The beacons are numbered from 1 to 7. In 1952, it was reported that the beacons No. 2, No. 3 and No. 6 had been destroyed, and that lights had been established on beacons No. 4, No. 5 and No. 7.

Page 476.—*After* line 22 *insert* :—
On the eastern shore of Guindulman bay there is a **T**-shaped pier, 670 feet ($204^{m}2$) long, with depths of 17 feet ($5^{m}2$) at the north-western end, and 26 feet ($7^{m}9$) at the south-eastern end. A buoy marks the western approach, and another buoy the south-western approach to the pier. [The anchorage recommended is about 1¼ cables south-westward of the pier, in a depth of 7 fathoms ($12^{m}8$), mud.]

Page 478.—*After* line 33 *insert* :—
An obstruction, which dries 2 feet ($0^{m}6$) at low water, lies about 2 cables west-north-westward of the front leading light beacon.

Page 479.—Line 33 : *For* " **bank** " *read* " **banks** "
After line 38 *insert* :—
A bank, with a depth of 65 fathoms ($118^{m}9$), was reported, in 1951, to lie about 6½ miles northward of Tambisan point.
[Line 49 : *After* " importance." *insert* :—A church spire in the town and a water tank about three-quarters of a mile south-eastward of it are prominent landmarks.]

[**Page 480.**—Lines 24-25 : *Delete* " Water " to " pier."]

[**Page 481.**—Line 29 : *Delete* " **Buoys.**— "]
[Lines 48-49 : *Delete*.]

[**Page 482.**—Lines 47-48 : *Delete* " Water " to " pier."]

Page 484.—Line 2 : *After* " structure," *insert* " 25 feet ($7^{m}6$) in height,"
[Line 43 : *Delete* " **Light.**— "]
[Lines 47-49 : *Delete*.]

[**Page 485.**—Line 37 : *After* " chart " *insert* " , and by a tripod beacon situated about 4½ cables south-westward of Miray point "]
[Line 41 : *After* " pier " *insert* " , which is in ruins,"]
[Line 42 : *For* " 10 feet ($3^{m}0$) " *read* " 21 feet ($6^{m}4$) "]
[Line 54 : *After* " **Directions.**—" *insert* :—The usual anchorage is about 6 cables west-north-westward of Cabgan islands in a depth of about 35 fathoms ($64^{m}0$), with Mount Silla bearing 287° and the western extremity of Naburos island bearing 177° ; this anchorage is exposed and the holding ground poor and rocky.]

[**Page 486.**—*After* line 40 *insert* :—
Chart 3426, plan of Plaridel and Inamucan bay.]
[Lines 41, 42 : *Delete* " (Usukan) "]
[Line 51 : *Delete.*]
[Line 52 : *Delete* " (Port Langaran) "]
[Line 53 : *Delete* " (Inamukan) "]

[**Page 487.**—Line 1 : *For* " *Port Langaran* " *read* " *Plaridel and Inamucan bay* "]
[Line 11 : *After* " **Directions.**— " *insert* :—The usual anchorage is about 3 cables northward of Baubaon point, in a depth of about 40 fathoms (73^{m}2).]

[**Page 488.**—Line 15 : *Add* :—The eastern and western entrance points of the cove are marked, respectively, by a white spherical buoy and a white can buoy ; these buoys are privately maintained.]
[Line 23 : *Add* :—There is a hospital in the town.]

Page 489.—Line 16 : *Delete* " 1939 " to " (6^{m}1) " and *substitute* " 1951, had a depth of 15 feet (4^{m}6) "
[*After* line 41 *insert* :—
About half a mile south-westward of the light tower on Tabu point there is a gap in the coconut trees fringing the beach through which the fields behind show clearly ; anchorage, in a depth of 12 fathoms (21^{m}9), about one cable offshore, may be obtained by approaching with the gap bearing 291°, which leads between the off-lying reefs, and anchoring when the light tower bears 354°, distant about 1¼ cables. The set of the tidal stream in the approach must be guarded against.]

Page 490.—[Lines 12, 22 : *Delete* " (Lokulan) "]
Lines 29-30 : *Delete* " This " to " 1950." [and *substitute* :
A 16-foot (4^{m}9) patch lies about 7 cables eastward of the shoalest part of the eastern group of the Loculan shoals.]
[Line 34 : *Delete* " (Kulasejang) "]
[Line 40 : *For* " 8½ " *read* " 9½ "]
[Line 42 : *For* " 6½ " *read* " 7½ "]
Lines 44, 50-51 : *Delete* " , but " to " missing "

[**Page 491.**—Line 6 : *Delete* " (Migkaniguing) "]
[Lines 13-14 : *Delete* " The " to " head." and *substitute* :—The pier, which is privately maintained, had depths alongside in 1953, of from 24 feet (7^{m}3) at its head, shoaling regularly to 16 feet (4^{m}9) 1,000 feet (304^{m}8) within the head. Vessels berth on the eastern side of the pier only. Submerged piles, the remains of an old pier, extend 200 feet (61^{m}0) beyond the head, in the line of the pier.]
[Lines 30-31 : *Delete.*]
[Line 36 : *After* " 232° " *insert* " , taking care to avoid the 16-foot (4^{m}9) shoal about 7 cables eastward of the Loculan shoals,"]

[**Page 492.**—*After* line 7 *insert* :—
There is a concrete **T**-headed pier, with a depth of 21 feet (6^{m}4) at its head, about three-quarters of a mile north-eastward of the

Page 492 continued.

mouth of Agus river; a building with a tower and an aluminium coloured tank are situated, respectively, close south-eastward and about 1¼ miles south-south-westward of the pier.]

[Line 10: *Add*:—There is a rock causeway with a wooden pier head close eastward of Camp Overton; it has a depth of 12 feet ($3^{m}7$) at its head.]

[Line 14: *Add*:—A cross on the dome of a church in the town is prominent from seaward.]

[Line 44: *After* " **Dangers.**— " *insert* " **Light.**— "]

Page 493.—Lines 13 and 51: *For* " Cagayan " ***read*** " Cagayan de Oro "

Line 13: *After* " (Kagayan)," ***insert*** " a port of entry, and "

Line 20: *Add*:—Northward of this pier is an **L**-shaped pier, with a depth of 36 feet ($11^{m}0$) at the face. These piers are well protected except from north-westward.

[*After* line 20 *insert*:—

A *white* obstruction light is exhibited from the top of an aluminium coloured water tank at Bugo which is a prominent mark.]

Line 35: *For " Kagayan " read " Cagayan "*

Lines 48-49: *For* " 498 feet ($151^{m}8$) " ***read*** " 600 feet ($182^{m}9$) "

Line 49: *For* " 22 feet ($6^{m}7$) alongside." ***read*** " 31 feet ($9^{m}4$) at the northern end, 30 feet ($9^{m}1$) in the middle, and 21 feet ($6^{m}4$) at the southern end. [Pilotage is compulsory for berthing and unberthing at the wharf.] "

Page 494.—Line 2: *For* " Cagayan " ***read*** " Cagayan de Oro "

[Line 5: *After* " **Dangers.**— " ***insert*** " **Light.**— "]

Lines 28 and 32: *For* " Canauayor " ***read*** " Canauayon "

[Line 37: *Add*:—A light is exhibited, at an elevation of 25 feet ($7^{m}6$), from a mast at the root of the pier.]

Page 495.—[Line 32: *For* " on " ***read*** " about a quarter of a cable within "]

Lines 39-40: *Delete.*

[**Page 496.**—Line 4: *After* " **Dangers.**— " ***insert*** " **Light.**— **Beacons.**— "]

[*After* line 21 ***insert***:—

About 11 miles south-eastward of Sipaca point and close southward of Medina village there is a small pier with a **T**-head composed of five dolphins, with a least depth of 21 feet ($6^{m}4$) alongside; there are mooring posts onshore. There is no anchorage owing to the depth offshore, and the pier is exposed to the North-east monsoon.]

[*After* line 30 ***insert***:—

There is a privately maintained wharf, about 200 feet ($61^{m}0$) long, with depths of from 36 to 42 feet ($11^{m}0$ to $12^{m}8$) alongside, about 2 miles westward of Gingoog village.

The head of a privately maintained **L**-shaped pier at Anakan, about one mile westward of Odiongan village, lies about three-quarters of a cable offshore; it is 212 feet ($64^{m}6$) long extended by

Page 496 continued.

dolphins into a **T**-head with a total length of 700 feet (213^{m}4) and with depths of from 23 to 30 feet (7^{m}0 to 9^{m}1) alongside.

A light is exhibited at the root of the pier.

A pair of triangular leading beacons, painted in red and white stripes, are secured to trees on the hillside south-westward of the pier, at elevations of about 250 and 600 feet (76^{m}2 and 182^{m}9); these beacons in line, bearing 132°, lead to the anchorage north-westward of the pier, but they are difficult to distinguish beyond a distance of 1½ miles; the eastern peak of a low ridge of hills behind the marks bearing 132° will serve as a guide from a distance.

Anchorage may be obtained, in a depth of about 40 fathoms (73^{m}2), north-westward of the pier, in good holding ground, with Anakan point bearing 078°.

There are two mobile 15-ton cranes and one 25-ton crane on the pier.

Fresh provisions are obtainable, but fresh water is not.

There is a well equipped hospital.]

[**Page 497.**—Line 15: *After* "**harbour.**—" *insert* "**Light.—Buoys.**—"]

[Line 19: *After* "point" *insert* "; a conical buoy marks its south-eastern edge"]

[Line 22: *Delete* "narrower." to "entrance" and *substitute* "narrower, a can buoy is moored off its western extremity. The bluffs forming the entrance, a black sawmill chimney near the southern end of the eastern entrance point"]

[*After* line 24 *insert*:—

A light is exhibited, at an elevation of 94 feet (28^{m}7), from a white concrete pillar, 30 feet (9^{m}1) in height, on the western side of the harbour about half a mile within the entrance.

Two mooring buoys are laid about 1¾ and 3½ cables south-eastward of the light-structure; there are two mooring posts on the shore below the light-structure.]

[*After* line 34 *insert*:—

To enter the harbour a vessel should bring the light-structure to bear 215° and keep it so until the western entrance point bears 325° when she should alter course to 180° and anchor or secure.]

[Line 36: *Delete* "**Buoys.—Beacon.**—"]

[Lines 38-39: *Delete* "and" to "station"]

[Lines 49-50: *Delete* "A white" to "*31′ E.*)," and *substitute*:—

"Magallanes village (*Lat. 9° 01′ N., Long. 125° 31′ E.*), is situated"]

[Lines 52-53: *Delete.*]

[**Page 498.**—Lines 15-16: *Delete.*]

Page 499.—Line 16: *After* "tower," *insert* "65 feet (19^{m}8) in height,"

[**Page 500.**—*After* line 44 *insert*:—

A pier extends about one cable north-eastward from the shore at Taggat, about half a mile south-south-eastward of Lacay Lacay point. Anchorage may be obtained, in a depth of about 20 fathoms (36^{m}6), about 1½ cables north-eastward of the pier.]

Page 501.—[Line 16 : *Delete* " **Buoy.**— "]

[Line 19 : *After* " Luzon " *insert* " ; there is a municipal hospital in the town "]

[Lines 27-29 : *Delete.*]

[*After* line 33 *insert* :—

In 1953, there was a sandbank, awash at low water, close within the entrance to the river.]

Line 49 : *Delete.*

Page 502.—*After* line 42 *insert* :—

At Nulton point there is a pier, about one cable long, with a depth of 13 feet ($4^{m}0$) at its head. A prominent tank stands about one cable south-south-eastward of Nulton point.

Page 509.—Line 24 : *Delete.*

Page 510.—Line 9 : *Delete.*

Page 511.—Line 14 : *Delete.*

[**Page 515.**—Line 34 : *After* " church." *insert* :—A monument stands on the top of an 84-foot ($25^{m}6$) hill on the southern side of the town.]

[**Page 516.**—Line 20 : *After* " town." *insert* :—A drying reef lies about 3¼ cables north-north-eastward of the church at Gumaca.]

[**Page 520.**—Line 54 : *After* " prominent " *insert* " , as is a church with a galvanised iron roof and a steeple "]

Page 522.—Lines 3-4 : *Delete* " 24 " to " dredging." and *substitute* " 20 feet ($6^{m}1$) was reported alongside, in 1951."

Line 23 : *For* " **Buoy.—Beacons** " *read* " **Buoys** "

Line 25 : *For* " are two inlets " *read* " lies Larap bay and another inlet,"

After line 31 *insert* :—

Two mooring buoys, privately maintained, are moored off this pier.

[Line 35 : *After* " **Beacons.**— " *insert* " **Pilotage.**— "]

[*After* line 41 *insert* :—

Pilotage is compulsory for merchant vessels.]

[Line 42 : *For* " 144° " *read* " 146° "]

Line 51 : *Add* :—A tower is situated about 3½ cables northward of the pier.

[**Page 523.**—Line 5 : *For* " lights " *read* " beacons "]

[Line 9 : *For* " **Lights.**— " *read* " **Light.**— "]

[Line 40 : *After* " island." *insert* :—A 4¾-fathom ($8^{m}7$) shoal was reported, in 1952, to lie about 1½ miles south-eastward of Medio reef.]

[**Page 524.**—Lines 28-30 : *Delete.*]

[Line 43 : *After* " should " *insert* " , having taken care to avoid the 4¾-fathom ($8^{m}7$) shoal about 1½ miles south-eastward of Medio reef,"]

[**Page 525.**—*After* line 14 *insert* :—
A shoal, with a depth of $2\frac{3}{4}$ fathoms ($5^{m}0$) over it, was reported, in 1953, to lie about $2\frac{1}{2}$ miles north-westward of Lima rock.]
[*After* line 39 *insert* :—
A bank, with a depth of 10 fathoms ($18^{m}3$) over it, was reported, in 1953, to lie about 13 miles north-north-eastward of Matandumaten rock.]

Page 526.—Line 21 : *After* " sea." *insert* :—Two beacons, consisting of bamboo poles, with palm topmarks, mark the edge of the reef on the eastern side of the river mouth.

Page 527.—Line 50 : *After* " pier " *insert* " , about 1,230 feet ($374^{m}9$) long, with a depth of 15 feet ($4^{m}6$) at its head,"

Page 529.—Line 32 : *Add* :—In 1951, this buoy was reported to be missing.

Page 531.—[Lines 3-4 : *Delete* " 300 " to " beacons " and *substitute* " 420 feet ($128^{m}0$) long, with depths of from 16 to 30 feet ($4^{m}9$ to $9^{m}1$) alongside, in 1953 ; there are a number of dolphins "]
Line 5 : ————————————————————
[Line 6 : *For* " 10 " *read* " 15 "]

Page 533.—Line 50 : *For* " and " *read* " in 1951, this beacon was reported to be missing ;"

Page 539.—Heading : *For* " CANTANDUANES " *read* " CATANDUANES "

Page 542.—*After* line 52 *insert* :—
A concrete water tank is situated about 2 cables south-eastward of this light-structure.

Page 544.—Line 15 : *For* " 23 feet ($7^{m}0$) " *read* " 20 feet ($6^{m}1$) "

Page 547.—Line 7 : *For* " Sobok " *read* " Soboc " and *after* " island." *insert* :—Tambugnon (Tambongon), where there is a prominent church tower, lies about one mile westward of the entrance to Soboc bay.

Page 551.—Lines 13-14 : *Delete.*

Page 553.—Line 15 : *For* " a depth of 29 feet ($8^{m}8$) " *read* " depths of from [18 to 31 feet ($5^{m}5$ to $9^{m}4$), in 1952,] "
[Line 17 : *Add* :—Pilotage is compulsory for merchant vessels.]

Page 554.—*After* line 23 *insert* :—
There is a pier for barges at Nato.
Line 24 : *Add* :—In 1951, this buoy was reported to be missing.

[**Page 555.**—Line 13 : *Add* :—A mole extends about 2 cables from the eastern shore about $1\frac{1}{4}$ miles from the head of the bay.]

Page 557.—Lines 9-10 : *Delete.*

Page 558.—Line 35 : *For* " 21½ feet ($6^{m}6$) " ***read*** " 20 feet ($6^{m}1$) at the western end, 23 feet ($7^{m}0$) at the middle, and 8 feet ($2^{m}4$) at the eastern end "
Line 39 : *After* " structure," ***insert*** " 51 feet ($15^{m}5$) in height,"

Page 559.—Line 13 : *Delete.*

Page 565.—Line 43 : *After* " bar." ***insert*** :—There is a wooden pier for launches at Dolores.

Page 568.—*After* line 50 ***insert*** :—
There are two piers near the mouth of Borongan river on its south-western side.
Lines 52-53 : *Delete* " 1938 " to " head ; " and ***substitute*** " 1951, it had a depth of 20 feet ($6^{m}1$) at its head, and 19 feet ($5^{m}8$) on either side ; "

Page 571.—Line 33 : *For* " **Buoy** " *read* " **Buoys** "
Line 50 : *Add* :—A red drum buoy is moored southward of this reef.

Page 572.—Line 20 : *After* " it " ***insert*** " has a prominent church tower, and "
Line 22 : *For* " A mooring buoy is " ***read*** " Three privately maintained mooring buoys are "

[**Page 577.**—*After* line 16 ***insert*** :—
A light is exhibited from the roof of the observatory on Panirugan point, about 4 miles westward of Jinamoc island.]

Page 578.—Lines 10-11 : *Delete* " Two " to " second " and ***substitute*** " A pair of leading beacons "
Lines 13, 14 : *Delete* " , in each case,"
Lines 16-17 : *Delete* " first " to " pair " and ***substitute*** " beacons "
[Line 20 : *Delete* " six " to " 19 " and ***substitute*** " four can buoys "]
[Lines 21-22 : *Delete* " All " to " 1950."]
[*After* line 29 ***insert*** :—
A red conical buoy is moored on the northern side of the channel about 8 cables north-north-eastward of Panirugan point.]
Lines 53-54 : *Delete* " the " to " pair " and ***substitute*** " to the buoyed channel until the leading beacons "

Page 579.—[Lines 2-3 : *For* " abeam of No. 9 buoy " ***read*** " Jinamoc Island light-structure bears 069° "]
Line 14 : *After* " (Takloban)," ***insert*** " a port of entry and "
[Line 17 : *After* " alongside " ***insert*** " , but was unserviceable, in 1950 "]
Line 21 : *Delete* " **Radio station.**— "
Line 24 : *Delete.*
Line 39 : *After* " **Dangers.**— " ***insert*** " **Light.**— "

Page 580.—Line 9 : *For* " 16 feet ($4^{m}9$) " ***read*** " 13 feet ($4^{m}0$) "

Page 581.—Lines 4-5 : *Delete* " , on " to " bands "
After line 8 *insert* :—
A light is exhibited, from a beacon, on a sunken rock, situated about 2 cables eastward of No. 20 beacon.
A shoal, with a depth of 14 feet ($4^{m}3$) over it, lies about 2½ cables north-north-eastward of No. 20 beacon.
Line 12 : *Add* :—A 15-foot ($4^{m}6$) shoal lies off the entrance to this channel, about 1¾ cables north-north-eastward of Guintiguian point.
Line 52 : *After* " posts," *insert* " 19 feet ($5^{m}8$) in height,"

Page 582.—*After* line 9 *insert* :—
A shoal, with a depth of 3 feet ($0^{m}9$), was reported, in 1951, about 2¾ cables west-south-westward of Ivantacut islet.
Line 32 : *For* " Three " *read* " Two "
Line 33 : *Delete* " one " to " of " and *substitute* " and are "
Lines 35-37 : *Delete.*
Lines 38, 42, 47 : *Delete* " front "
Lines 40-41 : *Delete* " , situated " to " beacon "
Lines 42-43 : *For* " in line with the rear beacon," *read* " , which was reported to be obscured by trees, in 1950,"
Lines 47-48 : *Delete* " in " to " beacon "

Page 583.—Line 2 : *For* " leading line " *read* " reach "

[**Page 585.**—Line 15 : *Delete* " **Light-buoy.**— "]
[Lines 33-36 : *Delete.*]

[**Page 599.**—Line 27 : *After* " **dangers.**— " *insert* " **Beacon.**— "]

[**Page 601.**—Line 15 : *Add* :—A beacon marks the outer end of the reef.]
[Line 16 : *After* " **dangers.**— " *insert* " **Beacons.**— "]
[*After* line 40 *insert* :—
The northern channel is marked by beacons.]

Page 608.—Line 31 : *Add* :—Another one-fathom ($1^{m}8$) patch lies about three-quarters of a mile southward of the point.

[**Page 610.**—Line 25 : *After* " islet." *insert* :—A shoal, with a depth of 4½ fathoms ($8^{m}2$) over it, lies in the approach to the harbour, about 3 cables north-eastward of the outer end of the extensive reef.]

Page 614.—Lines 7-8 : *Delete* " 1938 " to " north-eastward." and *substitute* " [1952], depths of [from 20 feet ($6^{m}1$), at] the south-western [end, to 2 feet ($0^{m}6$) at] the north-eastern [end]. "
[Line 11 : *Add* :—A mooring buoy is laid off the south-western end of the wharf.]
[Line 44 : *For* " and a " *read* " , a "]
[Line 45 : *After* " ward " *insert* " and a 6-fathom ($11^{m}0$) patch lies about 7 cables south-westward "]

Page 623.—Lines 4-7 : *Delete.*
[Lines 13-14 : *Delete* and *substitute* :—
" 1953, was in ruins."]

[**Page 624.**—*After* line 40 *insert* :—

A pier, with depths of from 28 to 55 feet ($8^{m}5$ to $16^{m}8$) alongside its outer side, extends about 3½ cables north-north-eastward from the south-eastern shore about 1½ miles from the head of the bay.]

[Line 45 : *After* " **Directions.**— " *insert* " **Buoy.**— "]

[Line 52 : *After* " them," *insert* " marked by a black buoy,"]

Page 627.—Line 38 : *Delete.*

Page 631.—[Line 27 : *For* " 1938 " *read* " 1948 "]

[Line 28 : *Delete* " , where " to " vessel " and *substitute* " ; there are no berthing facilities "]

Line 35 : *Delete.*

Page 694.—*For* " Steenen Nuk " *read* " Steenen huk "

NEW AND ALTERED NAMES.

The following list gives new names and alterations in old names which will be adopted in all Hydrographic publications affected as opportunity occurs :—

New name	Page of Pilot	Obsolete name
[Anakan	496	—]
[Anakan point	496	—]
[Aran	49	—]
Bacood point	377	—
[Bakapit	154	—]
[Benrinnes reef	143	—]
[Boaan island	135	Bo aan island]
[Bonting, Pulau	136	Round islet]
Cagayan de Oro town	493	Cagayan town
Canauayon anchorage, islet	494	Canauayor anchorage, islet
[Canda	370	—]
[Castañas	370	—]
[Glen rock	135	—]
[Hetafe	470	—]
[Jetafe	470	—]
[Kinabalu shoal	154	—]
[Kinabigan	320	—]
Larap bay	522	—
[Loya river	448	—]
Maco	296	—
[Medina village	496	—]
[Pisau, Tanjong	135	Pandaras, Tanjong]
[Pontevedra town	436	—]
[Powell rock	135	—]
[Quinabigan	320	—]
[S. Rita ; Batangas bay	311	—]
[S. Teodoro	315	—]
[Sibaung	135	Si ba ung]
[Sinapsapan point	336	—]
Soboc bay	547	Sobok bay
[Suba Nipa	258	—]
[Taggat	500	—]
Tambugnon	547	Tambongon
[Tumajubun point	234	—]
[Turtle rock	135	—]

Printed in Great Britain under the authority of Her Majesty's Stationery Office
by Charles Birchall and Sons, Ltd., 17 James Street, Liverpool.
Wt 29411/H4263 4/54 K29 C.B.&S.Ltd. Gp575

UNIVERSITY OF MINNESOTA
wils v.1
656 G79e
Great Britain. Hydrographic Dept.
Eastern Archipelago pilot / comp. from v
3 1951 002 285 352 F

WILSON
ANNEX
AISLE 59